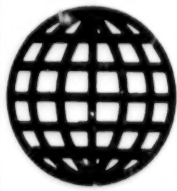


JPRS-EST-92-023  
27 JULY 1992



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# ***JPRS Report***

# **Science & Technology**

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***Europe  
Economic competitiveness***

# Science & Technology

## Europe

### Economic Competitiveness

JPRS-EST-92-023

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27 July 1992

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## SCIENCE & TECHNOLOGY POLICY

### EC Commission Requests Increased R&D Funding in Fourth Framework Program

92BR0423 Paris *ELECTRONIQUE INTERNATIONAL*  
HEBDO in French 30 Apr 92 p 7

[Text] Spring maneuvers: In Strasbourg, France, the EC Commission has presented a project to the European Parliament aimed at increasing R&D investment from ECU2.4 billion in 1992 to ECU4.2 billion in 1997. The chairman, Filippo Maria Pandolfi, European commissioner responsible for advanced technologies, also stated that the EC might be able to help in the construction of a plant for producing 64-Mb DRAMs [dynamic random-access memories] because of the strategic importance of this field. These projects are to be debated by Parliament and the European Council of Ministers, who must vote the budget for phase four of the R&D Framework Program (1994-1998).

### FRG Research Policy Criticized for 'Lack of Vision'

92WS0504A Frankfurt/Main *FRANKFURTER ALLGEMEINE* in German 4 Mar 92 p N3

[Article by Rainer Floehl: "Lack of Vision—Less Basic Research"]

[Text] When it comes to celebrating Nobel Prizes for German scientists, Federal Minister for Research Riesenhuber lavishes praise and recognition on the recipients, because he and his ministry can share in the glory. This confirms the impression among the public that it is he alone who determines research in Germany. However, Riesenhuber categorically denies such allegations. In discussions, he appears modest, saying he does not have "overall responsibility."

While this is true, the Federal Ministry still spends more than DM8 billion per year for research and technology, i.e. a major portion of the DM67 billion which were allocated for research and development in the old Federal Republic in 1989. DM43 billion come from private industry, DM14 billion from the federal government, DM9 billion from the individual states and DM1 billion from other sources. However, the amounts are much smaller when it comes to basic research, the most important element of research policy. In the past few years, the percentage share of basic research in total expenditures declined considerably. While Riesenhuber has managed to increase the percentage of basic research in his budget from 26 to 39 percent since taking office in 1982, these funds are by no means freely available. For instance, a large portion goes to large research institutions.

It is difficult to get a clear picture of the situation because the research system resembles a maze. There is research going on at universities, at the Max-Planck Society, at the Fraunhofer-Institutes, at large research institutions and at federal and state institutes. The states

provide the basic equipment for universities which currently accounts for DM8 billion. Additionally, there are DM1.2 billion from the federal and state governments which are awarded through the German Research Society (DFG). The Max-Planck Society gets DM1.2 billion from the federal and state governments.

Research and development outside the university receives DM8 billion. These funds are awarded under ministerial direction, i.e. they are geared towards certain areas and frequently awarded without effective quality control. Military research accounts for approximately DM3.3 billion. Another DM3.3 billion go to large research institutions and DM2.6 billion to government institutes for so-called departmental research. This includes institutions such as the Federal Health Agency and the Federal Agency for Physics and Technology as well as the Federal Agency for Milk Research and the Military Institute for Materials Research. These government institutions receive more funds for application-specific research than the main pillars of German science, the Research Society and the Max-Planck Society taken together.

Although they receive large amounts of money, the institutions which are accountable to the various departments are not allowed to do basic research. This is monitored by the Federal Audit Office. In our federal state, the individual states are responsible for basic research support. However, they are increasingly reluctant to meet their responsibilities. In many cases, basic equipment for universities no longer meets requirements. Teaching is taking up more and more funds. Today, the share of universities in the total research budget has fallen to just under 14 percent. Therefore, the concern that research may be leaving the universities is quite justified.

In this situation, many scientists expect help from the Ministry for Research. To be sure, Riesenhuber gradually increased the project funds for supporting basic research which go primarily to universities from DM310 million to DM640 million. The states have accepted the fact that the federal government will support areas which are important in terms of research policy in addition to large-scale research. These include marine and polar research, the geosciences, research and climate, biotechnology and information sciences, health research as well as materials research.

However, Riesenhuber wants to use his funds to subsidize basic research only temporarily. He says that the activities of the Research Society must not be undermined. This is somewhat contradictory, at least as long as the states do not fulfill their responsibilities. After all, Riesenhuber's funds for this purpose are half the budget of the Research Society. AIDS research, for instance, would be the responsibility of the states, since they are responsible not only for research but also for health. Riesenhuber had planned to discontinue funding, but will probably have to continue the support under pressure from the public and the scientific community.

As to basic research, Riesenhuber considers it his primary responsibility to pave the way for changes at the universities, both with regard to subject matter and structure. On the one hand, he wants to make it possible to quickly start new developments, for instance in the field of superconductivity or nanotechnology. Secondly, he wants to bring about structural changes. A good example are the gene centers. In his opinion, his ministry in cooperation with the universities, the Max-Planck Society and private industry has succeeded in establishing new laboratories which attract young scientists.

According to Riesenhuber, the ministry succeeded in bringing about a similar structural change in ecology research. He says that in the early eighties, this field had not been pursued very consistently. With the Solling project, research into forest damage had been expanded into systems research. Similar efforts are now under way with environmental research in Leipzig. Riesenhuber says that in Leipzig only the core consists of a large-scale research institution. Its objective is to ensure stability and continuity. It serves as a center for study groups coming from different institutions. As other examples of structural changes Riesenhuber points to the clinical research groups which receive substantial support from the ministry.

Even though these steps have helped 'cultivate the research land,' Riesenhuber shares the concern that the work may be spread too thinly. Here, he is in agreement with physicist Nikolaus Fiebiger from Erlangen, who only wants to establish limited-time institutes. Just as vehemently, he demands a research policy based on strategic thinking. Recently, the Scientific Council deplored the lack of a research policy which would search out research gaps and look towards the future. In his view, such a 'prospective research support' is absolutely essential in order to improve vitality and innovation. In the recent Bundestag debate on large-scale research institutions, Wolf-Michael Catenhusen, SPD spokesman for research policy, accused Riesenhuber of lacking vision.

This criticism is not unfounded. The ministry is occupied more with abandoned polluted areas and large-scale research institutions than with new concepts. However, research policy is no longer the responsibility of one single department. It is increasingly affecting technology and industrial policy. And this is a matter of concern for the whole federal government. But as long as the federal government, despite differing views of its Minister for Research, clings to outdated space concepts, there is little hope for a far-sighted research policy based on strategic thinking. Even considering the needs of the new states we cannot simply continue to increase the funds for research and development. Rather, they have to be used more sensibly.

### FRG Industrial Group Criticizes EC Research Policy

92WS0526A Duesseldorf *HANDELSBLATT* in German 30 Apr 92 p 6

[Article by df: "A Dangerous Erosion of Competitiveness"]

[Text]

### German Industry/BDI Criticizes the European Research and Technology Policy

The Federal Association of German Industry (BDI) concludes in comments on the "European Research and Technology Policy," that new initiatives are urgently needed. At this time, there is a progressive erosion observable in the industrial basis of Europe.

The production of cameras and watches has migrated almost completely out of Europe except for minimum vestiges. In automobile manufacture and in consumer and high-technology electronics, Japan has already overtaken the Europeans. By far, most new developments in bioengineering and genetic engineering come from the U.S.

According to the analysis of the BDI, European companies have a weaker position than their Japanese competitors in almost all strategic high-technology markets. In semiconductors, the Japanese increased their share of world production from just under 40 percent in 1980 to 50 percent in 1990. With advanced memory chips, they have 90 percent. In microprocessors, American companies dominate with 80 percent of the world market.

According to the BDI, "The deficits in the horizontal technology of microelectronics jeopardize, over the near term, positions in markets with higher-grade technology that are still strong today. Such technology includes machine construction, automobile manufacture, electro-technology, precision mechanics and optics."

### High Technology Requires Cooperation Today

In the 1980s, the Japanese were able to increase their share of world production in information and communications technology from 15 percent to 24 percent at the expense of the Americans. During these years, the EC stagnated at 24 percent.

The BDI believes that the companies must find answers for themselves to the challenge of foreign competition in the market. However, "penetrating high-technology markets can no longer be done alone. High research and development, production, and marketing costs and the increasing globalization of the markets necessitate close cooperation between companies even extending beyond national borders."

### Multi-Branch, Declining, and Time-Limited

The EC is responsible for this, too. European research and technology policy must not exhaust itself in support

programs. In terms of focal points, the basic conditions and infrastructure prerequisites for industrial innovation must be improved in the EC. This includes the elimination of anti-innovation laws and regulations, harmonization of research-relevant rules, adapting the competition law to the changing globalization of the markets and providing effective protection of intellectual property.

The research and technology support must perform supplemental functions. This support is necessary to compensate for unfavorable basic conditions, to take foreign, technology-supporting activities into consideration, to improve the ability to cooperate in the international arena, and to compensate for the size disadvantages of small and medium-sized companies. According to the BDI, "To do justice to this supplemental character, the research and technology support must be multi-branch, limited-term, staggered on a descending scale, and oriented toward quality."

European research and technology policy should not replace national research policies and their proven structures but instead supplement these in a meaningful way. The scarce R&D resources in Europe need to be coordinated. The comparative advantages of cooperation must be utilized in as many areas as possible. Also, these resources should contribute to the harmonization of standards.

According to the BDI, "German industry emphatically supports all initiatives that bolster or flank such cooperative efforts but not at any price. Support efforts from one or more governments may only be provided in accordance with market-economy foundations and for compelling reasons. Such support should help to bear some of the considerable costs of trans-border cooperation. In each individual case, care must be taken that the innovative forces of competition are maintained. To this end, the companies should receive the maximum possible freedom in selecting topics and creating concrete cooperation conditions." The more Europe consolidates as a technology community, the more care must be taken that the European economic sphere does not shut itself off from the outside. Only a Europe open to the world has a chance in the international division of work over the long term. Consequently, cooperation with the U.S. and Japan remains just as important as cooperation with the reforming countries in Central and Eastern Europe.

According to the BDI, the subsidiary function of European research and technology policy compared to national efforts continues to receive inadequate recognition. The ratio of national to EC support dropped rapidly in the 1980s. In 1981, the government budgets of the Federal Republic spent 26 times as much for research and development as the EC. In 1990, the R&D budget in Germany was only eight times as high.

#### **No Competition for National R&D Support**

On average in those years, the German budget grew by 4 percent, the European by 18 percent. While the EC

increased its application-oriented technology support, the Federal Ministry of Research in the Federal Republic continued shifting its focal points from market-oriented technology to basic research, precautionary research and long-term programs. Support for key technologies dropped considerably.

As the R&D commitment of the Community in the area of key technologies continues to grow, so does the danger of overlaps with national efforts. "However, this must not lead to a retreat of national research policy from strategically important technology fields." National R&D programs are also necessary in the future. On the other hand, if support for research and development only occurs on a European level, "There is the danger of an averaging to a European level, jeopardizing national leading positions. Consequently, the restrictive support policy of the Community promoting national retreating tendencies must be examined. A support policy allowing room for national measures and better coordination between European and national research policy is necessary."

Expanding the total budget of the Community because of a stimulation of the European research support, however, is rejected by the BDI. More importance must be given to strategic future fields such as research in the budget of the Community by redistributing budget funds.

#### **German Government Proposes Revision of EC R&D Policy**

*92MI0536 Bonn BMFT JOURNAL in German Apr 92 pp 8-9*

[Text] The future course of European research policies will be set by research ministers meeting within the EC Council of Ministers during 1992. The agenda will include assessing the Second EC Framework Program, monitoring the Third Framework Program, and examining the Commission's proposals for the Fourth Framework Program covering with funding likely to exceed ECU10 billion (around 20 billion German marks [DM]) over a five-year period.

The federal government has just presented a discussion document with a view to enhancing the effectiveness of EC research policies, thus improving the division of responsibilities and work between national and community research funding. The main points discussed in the memorandum are as follows:

- Greater focusing of individual programs on priority aspects;
- Concentration on application-oriented research (including standardization) at the precompetitive stage and preventive research;
- EC-wide integration of climate research into an overall strategy;
- Opening-up of all EC projects to EUREKA [European Research Coordination Agency], and use of EUREKA to implement EC research policies;



- Improved access by small and medium-sized enterprises to EC research funding;
- Decentralization of EC program management taking advantage of national institutions;
- Medium-term increase to 6 percent in the proportion of the EC budget allocated to research (currently between 3 and 5 percent).

The document sets out the objective in detail, with supporting arguments. Areas of research funding that are already running successfully, such as those intended to strengthen cohesion, are not explicitly referred to; the following concentrates on certain major aspects.

Despite the reduced number of specific programs in the Third Framework Program, they continue to be too broadly based, resulting in duplication of national research programs and a flood of funding applications, only a fraction of which can be accepted for many programs. Prioritization and harmonization with national programs are therefore required at all stages, including that of planning.

The German proposals envisage an increase of almost 56 percent from the present 9 percent to 14 percent, in the proportion of the overall program allocated to climate, environmental, and marine research; an increase of over 71 percent, from the present 3.5 percent to 6 percent, for nuclear safety; and an almost 79 percent increase, from the present 2.8 percent to 5 percent, for renewable energies.

In environmental research, the EC should fund pilot projects as a means of increasing its contribution to the implementation of technologies it has funded and which have been developed by member states. Nuclear safety received too little attention in the Third Framework Program, an attitude that cannot be justified in light of the EC's responsibility, extending also to Central and Eastern Europe, and the common interest in stringent, internationally uniform safety standards. A common strategy is required, extending also to reactors meeting high safety requirements. The Fourth Framework Program must make provision for supporting this strategy.

The federal government had been forced to agree to excessively low funding allocations for renewable energies in the previous two outline programs so as not to jeopardize a compromise on the program as a whole; it therefore calls for a disproportionately large increase for this area.

The application-oriented (but precompetitive) IT [information technology] and telecommunications, industrial and materials technology, biotechnology, and renewable raw materials programs should remain the major targets of EC research funding, receiving up to 60 percent of the resources provided under the Fourth Framework Program. However, the IT and telecommunications allocation should be reduced from the present figure of nearly 40 percent to around 34 percent of the framework program, mainly to the benefit of biotechnology and

preventive research. Indeed, biotechnology is a key discipline for the future competitiveness of the European economy. Joint research in this area must enhance cooperation between laboratories in different member states and with EC industry, particularly small and medium-sized enterprises. In addition, the development of an efficient European infrastructure for collecting biological materials (microorganisms and cell cultures) for scientific research and technical exploitation is indispensable. The second-largest sector, preventive research, could receive an allocation of up to 35 percent.

The federal government is thus calling quite unequivocally for concentration on the true aims of the EEC treaty's chapter on research, namely, to increase the competitiveness of European industry and to maintain and improve living standards in the Community. Basic research, which should essentially remain the preserve of the individual member states and independent scientific bodies, must find room in the Community Framework Program only in exceptional cases.

Application-oriented research funding must not be equated with funding of individual sectors. The federal government rejects sectorial programs and similarly structured major projects, as it is convinced that they do more harm than good to the competitiveness of European industry.

Small and medium-sized enterprises face particular difficulties in submitting applications for EC funding owing to their distance from Commission headquarters, problems of language and finance, and staff shortages. The costs they incur in drawing up such applications is in many cases out of all proportion to the subsequent benefits. As a result, such enterprises' potential in terms of the EC is being insufficiently tapped and fostered. Support should be provided, for instance in the form of information centers in each member state, which would decentralize program administration, preference for small and medium-sized enterprises in calls for tenders, and sufficient time to submit applications and make the necessary preparations.

The Community cannot do without funding measures to promote the exploitation of intellectual resources, especially as a means of strengthening its cohesion. A desirable mix would consist of research grants for scientists (without rigid age limits), project funding for partnerships between laboratories, development of research networks, easier access to major scientific facilities, and funding of European scientific conferences. All this requires simplified and readily comprehensible implementation procedures.

#### **Humboldt Foundation To Increase Research in Eastern Germany**

92WS0551A Duesseldorf *HANDELSBLATT*  
in German, 6 May 92 p 8

[Text] The Alexander von Humboldt Foundation intends to increase its support of scientists from Central

and Eastern Europe. According to statements of the Humboldt Foundation opportunities for foreign scientists to cooperate with German science are more in demand than ever.

On the occasion of the yearly report for 1991, which was submitted in Bonn yesterday, representatives of the foundation announced that 2,641 scientists from 82 countries had applied for one of the 600 yearly Humboldt research grants. The strongest interest came from the countries of the former Soviet Union, and from India, Poland, China, the U.S., and Japan. Arts scholars, with only 19 percent of all applications, were represented less strongly than in previous years. Sixty-eight percent of the applicants were working in the natural sciences, and 13 percent as engineering scientists.

According to information furnished by the Humboldt Foundation about 80 percent of all the European applications came from Central and Eastern Europe (1,069 applicants). By comparison 212 applications came from EC member states and 52 from EFTA countries. Furthermore former Humboldt visiting scientists from these countries had, to a much greater extent than before, applied for renewal of their research grants, and asked for congressional subsidies or contributions for equipment and literature.

"The financial capacities of the Humboldt Foundation, whose program is set up for 'normal' times and for a predictable demand, have been far from sufficient to satisfy all wishes," explained the President of the Humboldt Foundation, Reimar Laust. First of all, the inclusion of the scientists from the new countries was progressing slowly. In the integration program of the Humboldt Foundation up to the present time 101 eastern German research grant recipients had received support during their stays at western German institutes, and in the Feodor-Lynen Program long-term residence abroad for research purposes had been made possible for 22 research grant recipients. According to the statements of the foundation more and more foreign visiting scientists were going to the new countries. In the meantime eastern German specialists were also present on the selection committee of the Humboldt Foundation.

The integration might go much faster if the employment situation in the new countries would improve, explained Heinrich Pfeiffer, General Secretary of the Humboldt Foundation. The willingness of former Humboldt visiting scientists to collaborate with eastern German colleagues was "amazingly strong."

The overall balance sheet for the year 1991 is as follows: a total of 2,163 scientists received support from the Humboldt Foundation during 1991. Six hundred and one research grants were re-awarded—135 research awards to foreign scientists, 26 Max Planck research awards to cooperative projects of German and foreign scientists (together with the Max Planck Society), 197 research grants to German scientists, and 10 Federal Chancellor grants to future American executives.

In the year 1991 the work of the Humboldt Foundation was financed with DM76.4 million from the budgets of both the Foreign Office (DM49.1 million), the Federal Ministry for Research and Technology (DM19.0 million), and the Federal Ministry for Education and Science (DM5.4 million), as well as the Federal Ministry for Economic Cooperation with DM2.9 million. The foundation was able to credit itself with DM2.7 million in private contributions—from the Krupp Foundation, the Association for the Endowment of German Science, the Fritz Thyssen Foundation, the Volkswagen Foundation, and other donors.

#### **German Strategy To Remain High-Tech Center**

92WS0559B Berlin *ING DIGEST in German* May '92  
p 26

[Unattributed article: "Germany High-Tech Site"]

[Text] Bernd Neumann, non-Cabinet minister in the BMFT [Federal Ministry for Research and Technology], feels there are three prerequisites to assure Germany's future as a high-tech center:

- Shorter secondary school and college time. Whereas in Germany university graduates only enter professional life at an average age of 28, graduates of this age in other countries already have their professional training period far behind them. There are many proposals to have the Abitur after 12 years of school and to shorten college-level study time by tightening up course content and the testing process, but without affecting the quality of education. In light of the European Internal Market, but also in light of the overloaded general and specialized universities, we must quickly make progress in shortening the time in secondary and higher education.
- Corporate tax reform. Compared to foreign competitors, German companies are burdened with taxes which are too high and not specifically linked to profits. The federal government and the Bundestag have made reform proposals concerning this which must be enacted quickly to keep the German economy from falling behind in international competition.
- Flextime. Increasing capital intensity and the use of the latest information and communications technologies make it seem reasonable to use alternative work schedules to the traditional five-day, full-time work week. Furthermore, a flexible work schedule meets the changed needs of many people.

#### **Italian Research Minister Interviewed on Science Parks**

92MI0568 Milan *ITALIA OGGI in Italian* 11 Jun 92  
p 32

[Interview with the Minister for University Education and Scientific and Technological Research, Antonio



Ruberti, by ITALIA OGGI, place not specified: "Science Parks Take Off", first paragraphs are ITALIA OGGI introduction]

[Text] Just three weeks after the establishment of the science and technology parks consortium in Rome, ITALIA OGGI interviewed the leading man behind the project: Minister for University Education and Scientific and Technological Research Antonio Ruberti.

The encounter helped to provide an understanding of the reasons why Italy lags behind other EC countries as far as technological infrastructures are concerned.

It was nevertheless clear that the minister intends bridging this gap as soon as possible by aiming at a science and technology park that is an improvement on other science parks around the world.

ITALIA OGGI: Minister, why is it that after so many years of technological infrastructures are now being developed in urban areas?

Ruberti: After being appointed research minister, I immediately took up the issue of science and technology parks. In particular, a report on the situation in southern Italy where there are broad discrepancies between public and industrial research contained a program for the creation of these parks. This proposal leads to a planning agreement between the Ministry of University Education and Research, the Ministry for Southern Italy, and the Treasury. This took longer than planned due to the changing ministers for southern Italy. Now the program has finally taken off and all the political parties acknowledge that the policy adopted by MURST [Ministry for University Education and Scientific and Technological Research] over the past few years was moving in the right direction.

ITALIA OGGI: Why have the first parks been built in the South?

Ruberti: Because unused funds allocated for industrial research were available for the South due to the weakness in the industrial sector there. To avoid periodical complaints about the difficulties in using funds due to structural reasons, it was decided to exploit them differently. The consensus on the parks program has confirmed our initial forecasts and we are confident about the future.

ITALIA OGGI: What is the goal of this program?

Ruberti: The objective of the park in the South is to attract industrial research laboratories in order to encourage them to work alongside universities and research centers. This should provide a better balance between the various research facilities in the South. However it is also important to promote parks in the rest of Italy based on the projects and proposals that are being put forward. Here the situation is different because there is a greater equilibrium between universities,

research organizations, and industrial laboratories. I hope that the program can soon be extended throughout the country.

ITALIA OGGI: Is Italy lagging behind the rest of Europe?

Ruberti: Yes, to a certain extent, even though there is widespread capability and hence Italy has the requisites to make up for lost time. The manufacturing, university, and research sectors are ready and willing. They only need encouragement and support. Under normal operating conditions the science and technology park must be self-sufficient on the research market, obtaining funding from various sources, both public and private, national and European. During the launching phase, however, government support is needed and, of all the complex financial difficulties, this is the most difficult knot to untangle. I would prefer however to be optimistic. In the same way that we succeeded in unfreezing 11 trillion lire for the South, we must do the same for central and northern Italy.

ITALIA OGGI: Is the number of promoters of the "Roman" scheme (FILAS, ACER, CNR [National Research Council], and ENEA [National Agency for New Technologies, Energy and the Environment] for example) on the increase?

Ruberti: The goal of each park is to "attract" others. A good example is the Trieste science park set up by government and the regional authorities, where projects and partners have multiplied.

ITALIA OGGI: In your opinion, what is the main function of a science and technology park?

Ruberti: The park must be the center of research, technology transfer, services, and must foster new projects.

ITALIA OGGI: Finally Minister, when do you think we will see a "science city" like the one in Japan?

Ruberti: I would like to answer this question by considering Italy as part of the European system. Europe's weak point is its fragmentation. The goal of the single market is to overcome this handicap. However, variety is valuable particularly during the changes that are taking place at this particular moment. It would therefore be simplistic to think we can transfer models of newer countries into the scientific and industrial sectors of other countries without taking into account the history and culture of the countries involved.

#### Government Support for Research in Eastern Germany

92WS0572A Duesseldorf *HANDELSBLATT* in German  
4 May 92 p 4

[Text]

#### R&D To Remain in Firms

Research in eastern Germany is to be stimulated with about 1.6 billion German marks [DM]. With aid programs alone, which benefit business, about 11,000 R&D jobs can be saved in 1992, said research minister Heinz Riesenhuber in Berlin. These are primarily permanent positions.

Riesenhuber aimed criticism at the Treuhandanstalt. It has split off research GmbHs [limited liability corporations] from the research departments of larger companies. A mistake, believes Riesenhuber, since the research departments should also be privatized in the interest of the firms. These spin-offs have now been stopped. Of about 70 former research GmbHs, it has so far been possible to privatize only 20. For the rest, which still have about 4,000 employees, there are obviously few interested parties. At the end of 1989, there were about 87,000 employees in industrial research departments, continued Riesenhuber. According to the latest studies, there are now only half as many.

The federal research ministry is concentrating primarily on three major areas of support: The construction of an industry-oriented R&D infrastructure, the increase in technological competitiveness of business enterprises, and the technology-related support of small and medium-sized businesses.

The lion's share of the aid, DM750 million, goes to project funding, which should support the technological competitiveness of businesses. The federal minister has also made about DM80 million available in 1992 for interim financing of about 250 projects in the new research GmbHs spun off from older organizations.

Riesenhuber refers to particularly lasting success in the area of support for technology-oriented establishments. After about two years, 13 of the 15 technology and research centers which were supported by the research ministry during the start-up phase are now completely ready for operation. A total of about DM32.5 million in aid has been awarded so far for this purpose, with which 1,000 new jobs have already been created on a total of 16,000 square meters of commercial space in 225 new firms. By 1993, with an outlay of DM40 million in aid, about 600 businesses with up to 6,000 jobs will be created on 77,500 square meters of commercial space. Furthermore, the German states are setting up an additional 15 technology centers under their own direction.

#### New Eastern German Technology Center in Halle Described

92WS0583A Duesseldorf *HANDELSBLATT*  
in German, 19 May 92 p 27

[Article by Dr. Engineer Wolfgang Lukas, Business Manager of the Technology and Founder Center Halle GmbH i.G.]

[Text] In the new federal states, for the promotion of the transfer of technology and of the founding of new businesses, technology and founder centers are being created on the proven model of the old federal states. The construction of 15 centers in the new federal states will be supported by the Federal Ministry for Research, Technology, and Communications, the states, and the communities, among others. One of the most modern centers is being created in Halle.

The essential goal here is also the advancement of the regional economy, in which the idea often results from the search for efficient utilization of the economic and research potentials which are becoming available through the new structuring. This particularly applies to the orientation of technology. For this reason in the technology and founder center in Halle the founding aspect at the present time is in the forefront, in order to fill the presently existing vacuum in the area of small and medium-sized industry.

#### Preventing the Drain of Qualified Employees

The shareholders of the Technology and Founder Center Halle GmbH—the city of Halle, the University, the Chamber of Industry and Commerce, and the Municipal and Saale District Savings Bank of Halle—have a common interest: that the economic region of Halle should develop rapidly, and that available research and engineering capacities should not move away from industry which is being restructured and universities and colleges which are being re-profiled, but should find in the Halle Technology and Founder Center an opportunity to continue to work in this region, with an orientation towards the future which is based on the viewpoint of a market economy.

This is only possible, however, if the Halle Technology and Founder Center itself receives start-up financing for several years, and does not need to realize any profits. The start-up financing and also the financing of the new construction is coming in part from the Federal Ministry for Research and Technology, among others. The largest share of the total financing is being assumed by the Federal Ministry for Trade and Commerce, the state of Saxony-Anhalt, and the Ministry for Trade and Commerce, Technology, and Communications of the state of Saxony-Anhalt. A municipal credit of the city of Halle is being used for complementary financing.

Extensive Infrastructure for Young Businesses Construction was begun on 6 April 1992. In a relatively short time the necessary planning and construction blueprints were worked out. Substantial support in the elaboration of problem definition for the building complex was also given by the Munich Partner Center [Partnerzentrum Muenchen].

On the Weinbergweg, in the middle of the university grounds and in the immediate neighborhood of the University Computer Center, the Max Planck Institute, and the headquarters of the Fraunhofer Society this new construction is being carried out on a piece of ground of

approximately 12,000 m<sup>2</sup>. On this area four structures will be erected which conform to the suburban type of architecture.

These buildings contain approximately 3,500 m<sup>2</sup> of rentable space for founders of businesses, in which rooms with varied usage possibilities will be offered—plain office rooms, but also technical rooms with increased height between floors and ceilings with greater weight capacities.

To the founders of new businesses an extensive infrastructure is available, in which the Technology and Founder Center Service provides secretarial services, library and data service, and references on questions of financing and support funds, and questions of business management. Well-arranged seminar rooms will be available for scientific and technical events. Those enterprises which are to be admitted to the Halle Technology and Founder Center are supposed to be either re-established, newly established, or young businesses (not older than two years).

The essential activity of these businesses is, first of all, supposed to be the execution of a plan of development, which is outstanding in its level of technology, and promises successful marketability. At the end of such a development plan preferably should come the manufacture and marketing of the developed product. Interested potential tenants who can primarily be classified as belonging to the service industry (for example, sales development businesses), are to be admitted to the Halle Technology and Founder Center only in second order of preference. It is no hindrance if an interested tenant is engaged in sales development in order to finance his own development plan.

Those interested in renting must present their plan or their business activity in terms of technology and industrial management in writing, and submit it to the Halle Technology and Founder Center's company association. After this, follow one or two discussions. The admission of tenants into the Halle Technology and Founder Center is decided on by the management of the company in consultation with the advisory committee.

#### **The Halle Technology and Founder Center Will Strive for a Healthy Mixture of Industries**

The entrepreneurs who will be future residents of the Halle Technology and Founder Center are to belong to the most varied branches of industry. Among these are microelectronics, process automation, special laboratory and experiment automation, software technologies, optics, and environmental and energy technology. Furthermore, the exchange of experience and cooperation between the entrepreneurs should be a good precondition for synergy effects. If everything goes according to plan the first tenants will move into the Halle Technology and Founder Center in the first quarter of 1993.

#### **French Expert on EC Research Policy, Future Swedish Role**

92WS05874 Stockholm NY TEKNIK in Swedish  
7 May 92 pp 22-23

[Article by Miki Agerberg: "Swedish Research Must Be Harmonized With EC"—first two paragraphs are NY TEKNIK introduction]

[Text] "Swedish research and development will benefit greatly if Sweden joins the EC. But there is a price. The goal of the EC research programs is to create a strong Europe."

So said Jean-Pierre Chevillot, a friend of Sweden and a central figure in French research policy. He is visiting Sweden this week.

When Chevillot steps to the speaker's platform in the IVA [Royal Academy of Engineering Sciences] building in Stockholm on Friday it is very possible that he will open his speech in perfect Swedish.

His fluency in Swedish is a result of the time he served as France's technical and scientific attache in Stockholm in the 1970s and the same is true of his interest in Sweden.

Today Chevillot has a central position when it comes to both French and European research policy. He has two jobs. He is the French technical and scientific attache to the EC in Brussels as well as vice chairman of the French research minister's Research and Technology Council in Paris, corresponding to Sweden's Government Research Advisory Board.

He is coming to Stockholm to participate in a seminar on EC research programs arranged by AFSR, the Swedish-French Research Association.

The topic is highly relevant. The European Economic Area (EEA) agreement means that all the EC research programs will be open to Sweden. If Sweden joins the EC, we will also be able to participate in making decisions about them.

At this time the entire EC research policy stands at a crossroads. The EC Commission has presented a proposal that involves a much greater emphasis on research and development, but also a shift toward more applied research aimed at key technical areas.

#### **EC Divided**

The proposal is highly controversial and divides the EC countries into two camps. Great Britain heads one, France the other.

In greatly simplified terms the differences look like this.

The British strongly champion competition and oppose state intervention. They want the EC to stick to basic research and projects that are far removed from the market.

The French, on the other hand, want to steer EC research toward the technical areas that are important for the future of European industry. They stress cooperation more than competition and want the EC to concentrate more on applied research and technical development.

#### Strengthening Industry

"The goal for EC research should be to strengthen the competitiveness of European industry," Chevillot stressed and pointed out that this goal is written into the Unity Act, one of the EC's basic documents.

Today the EC invests around 17 billion kronor a year in research and development. This is only about 3 percent of the EC budget and may seem an absurdly small amount. Especially if one compares it with agricultural policy which swallows more than half of the EC budget.

But the importance of EC research is greater than the figure indicates, according to Chevillot.

"The most important effect is that it has created new patterns of cooperation among businesses, institutions and nations. This permits better utilization of Europe's fragmented resources."

One example is the creation of the Franco-Italian electronics firm, SGS-Thomson. This was the result of contacts that were made within the EC's ESPRIT electronics program, according to Chevillot.

But the current insistence that EC research should not be market-oriented has been a hindrance, he claimed.

"The big European companies are afraid to cooperate in strategic R&D areas because they know they will be competitors on the market later on."

"But unless Europe's electronics users get together and create a market for components here, the European components industry will lose the battle with Japan and the United States."

#### Creating Alliances

He feels the EC should support the creation of alliances between users and suppliers on a European scale, exactly because they have succeeded by doing this in Japan.

[Agerberg] Isn't that a threat to free competition?

[Chevillot] There is no intrinsic value in free competition between Skane and Smaland or between Sweden and France. The important thing is to enable Europe to do well in the free global competition with the United States and Japan. Europe needs an industrial policy to manage that.

[Agerberg] Isn't France quite alone in this view?

[Chevillot] Not at all. France has abandoned its old ideas of protectionism and control from the top. This is no

longer a question of nipping up dying branches of industry, but of encouraging key high technology branches.

Today France advocates a balanced combination of competition and control that is rather like the German approach.

#### EC Close to French Line

The EC Commission's new proposal is close to the French concept, he noted. But that does not mean that the battle is won. The proposal must be approved by the Council of Ministers as well as the EC Parliament (the Council had its first briefing on the proposal last week).

Now Sweden wants to join the EC, and as a friend of Sweden, Chevillot is pleased. But today Sweden appears to be close to the British line. We asked if that was annoying.

Chevillot replied diplomatically that he was not very familiar with the policy of the Bildt government.

[Chevillot] Sweden has struck a good balance between control and competition so far, at any rate. Sweden is a land known for its spirit of accommodation.

[Agerberg] But now we have an industrial minister who does not want to be called that and whose stated goal is to eliminate his post.

[Chevillot] I agree that the title of industrial minister might give the wrong impression. But a minister of technical and industrial development is needed in Sweden if one looks at the matter from a European perspective.

Of course it will be beneficial for the EC's present member states if Sweden, with its technical and scientific potential, joins the EC. But the one that will get the most out of Swedish membership is Sweden itself.

Lots of new cooperation possibilities will open up for Swedish firms and institutions.

Many Swedes object that Sweden is already very open now and that it is involved in cooperation with the Europeans, the Americans and the Japanese. But it is only in one's immediate vicinity in Europe that one can form reliable and stable alliances.

[Agerberg] The Swedes are still discussing whether Sweden is really part of Europe.

[Chevillot] I know. But I am in no doubt about that. When I was in Stockholm I bought a 10-volume history of Sweden at Ronnell's secondhand bookstore on Birger Jarlsgatan. One only has to read it to see that Sweden's history is European. No one can change that.

[Agerberg] The EEA agreement gives Sweden free access to the EC research programs. Many Swedes think that is enough and do not want to merge or to membership.

[Chevillat] That depends on what one wants. With the EEA agreement Sweden can participate in research programs. But it cannot influence them. If you want to participate in making decisions you must be a member. You cannot be a member of the family just on Sunday, as Jacques Delors is fond of saying.

#### **French Space Minister Favors Ambitious Program**

92WS0597A Paris AFP SCIENCES in French  
14 May 92 p 10

[Unattributed article: "Mr. Curien for an 'Ambitious' European Program of Manned Space Flights"]

[Text] Paris—Mr. Hubert Curien, minister of research and space, announced his support on 12 May "for an ambitious program" in Europe in the area of manned space flights, stressing however that it would be necessary "to make every effort to gather partners" for this.

The minister who concluded, in the Senate, the colloquium organized by the Parliamentary Office of Scientific and Technological Choices, added that in this matter "the voice of France must be expressed clearly without unnecessary modesty on a platform of solid debate" in which there must not be "antiquated and obsolete arguments" or arguments based "on glory for glory's sake." "One can, one must find arguments to put forward" on a subject such as the Hermes space plane jeopardized by the German position.

The exploitation of low orbits is "important and fascinating," noted Mr. Curien. "It is necessary for everyone to discuss them and it is understood that this is a very hot topic for which solutions must be found, but we will not reduce space to this alone," said the minister before an assembly of deputies, senators, industrialists, and scientists.

After a day of debates during which all aspects of space were discussed, including military use of space, posing many questions which express real concerns, the minister, very closely listened to, continued: "I am a very good listener, but I have my convictions. I will listen as long as possible before deciding. Some say that it is necessary to hurry, to do this before July. In any case, by the end of this year, Europe must have made a clear decision. One thing that is certain is that a French or French-German position must not be set forth before we have talked to all our partners."

The German position expressed at the time of the Munich conference, last November, which questions the usefulness of Hermes, was reaffirmed in the morning session by Mr. Wolf-Michael Catenhusen, SPD [Social Democratic Party of Germany] deputy and president of the parliamentary committee for research and technology of the Bundestag. He reaffirmed that, "western Europe must give up the Hermes shuttle" and "restrict itself to construction of a single module of the European lab docked on the American space station Freedom."

This is a position which jeopardizes all the large programs of the European Space Agency (ESA)—especially Hermes and Columbus.

The more drawn out, step-by-step implementation of these programs is the subject of sweeping consultations within the ESA and will be debated again in Paris at the end of the month and again in June at the negotiator level and, again in Spain next November among the space ministers of the 13 member countries of the agency.

Presided over by Mr. Paul Lorient, senator and author of the Senate report on the orientations of French and European space policy, and his colleague Jacques Valade, the colloquium heard the advice of Mr. Yves Sillard, general delegate for Armament, who represented Minister of Defense Mr. Pierre Joxe, CNES [National Center for Space Studies] President Mr. Jacques-Louis Lions, Aerospatiale CEO Mr. Henri Martre, ESA General Director Mr. Jean-Marie Luton, Alcatel Espace Administrator/General Manager Jean-Claude Husson....

#### **FRG To Cut Jobs in Large Research Facilities**

92WS0598A Duesseldorf HANDELSBLATT in German  
4 Jun 92 p 7

[Article by rei: "Riesenhuber Wants to Send 1,200 Scientists into Retirement at Age 58"]

[Text]

#### **Large Research: Strict Austerity Program for Facilities in the Old Lands**

Large German research facilities are to eliminate more than 10 percent of their personnel in the coming years. Before the Research Committee of the Bundestag, Research Minister Heinz Riesenhuber (CDU) set the number of jobs to be eliminated at 1,700 to 1,900. Twelve hundred researchers may enter early retirement at the age of 58. The rest are to be eliminated through normal turnover.

The costs for the early-retirement solution will be shared equally, according to the plans of Riesenhuber, by the Research Ministry (BMFT) and the Federal Employment Agency in Nuremberg. The early-retirement plan will cost a total of 120 million German marks [DM]. About 22,000 people work in the large research facilities. Of these, 15,600 are permanent civil servants. They receive DM2.3 billion marks annually from the research budget of the federal government. Federal Employment Minister Norbert Blum has grave misgivings about the plan of his cabinet colleague.

The personnel restructuring comes about at the expense of the social security budget. Warnings and appeals to employers to avoid such practices would lose all credibility if the federal government uses them itself. Blum told Riesenhuber.



The same applies to the attempt by the federal government to redraw paragraph 128 of the Works Development Law that, until it was abolished, prevented such "on the bandwagon" solutions. The Constitutional Court declared the paragraph unconstitutional because of its many exemptions. Until 1994, the funds for large research facilities were to be held nominally constant. Corrected for the inflation rate, this signifies a considerable reduction in basic financing, explained Riesenhuber. The facilities would only receive more money if the wage settlements in the public-service sector increased by more than 3 percent.

The three centers in the new Lands are not affected by the austerity measures. They are just now being set up. Starting in 1995-96, the budget for large research facilities is to grow again. Riesenhuber's decision has different effects on the individual facilities. The losers are the Institute for Nuclear Energy Utilization in Shipbuilding and Shipping (GKSS) Research Center at Geesthacht, the Institute for Mathematics and Data Processing in Bonn and the Nuclear Research Centers in Juelich and Karlsruhe. Their funds will even shrink nominally.

Riesenhuber is hoping that the facilities will be able to make up some of the shortfall in budget funds by means of research contracts from the economy, known as third-party funds. In spite of the reductions, the scientists in the large research facilities should still be able to address new topics, even in the future.

#### France: CNES Presents 1992 Budget

92WS0613B Paris AFP SCIENCES in French  
27 May 92 pp 7-10

[Unattributed article: "CNES 1992 Budget: Almost 11 Billion Francs for the Development of French Space Activities"]

[Text] Paris—At 4.328 billion French francs [Fr], the contribution to the development of European projects on "space access resources" (the Ariane-5 heavyweight rocket, the Hermes space plane, and the Columbus module) is the largest single item in the 1992 budget of the National Space Studies Center (CNES), presented in Paris on 26 May.

CNES's total budget comes to Fr10.73 billion (a 9 percent increase over its 1991 budget of Fr10.071 billion). Of that amount, Fr7.79 billion are for program authorizations, Fr809 million for regular expenditures, and Fr2.13 billion for internal resources, according to Mr. Jean-Daniel Levi, general director of the French space agency and French representative to the European Space Agency (ESA). France's contribution to ESA represents 45 percent of the CNES budget.

The emphasis on the place of the future European space shuttle Hermes came as a bit of a surprise in the wake of comments made a few hours earlier by ESA's general

director, Mr. Jean-Marie Luton, who cited recommendations formulated the previous day at a special agency meeting in response to the need for financial restraint: postponing the flight of Hermes until 2005 and abandoning the Columbus program's man-tended free flyer (MTFF) laboratory.

"It would be exaggerating to say that we are overjoyed at this. Manned flights are a French idea, but we must be realistic. The plan of initially replacing Hermes with an unmanned demonstrator, the X-2000, merits discussion," Mr. Levi said. "It does not look that bad." CNES president Jacques-Louis Lions confirmed. "All the groundwork that has been laid can be used to carry out a major unmanned program. We do not deal in science fiction; we prepare the programs of the future."

Observation of the earth (natural resources, degradation of the environment) is playing an expanding role in CNES activities. CNES has undertaken a number of programs in this area at the national level (such as SPOT [Earth Observation Test System]), in cooperation with ESA, and in the context of bilateral programs (such as Topex-Poseidon and ERS [Earth Remote Sensing]). CNES will also participate in the upcoming "Earth Summit" in Rio.

Over 100 scientific teams are involved in basic microgravity research programs in the fields of physics, chemistry, biology, and space medicine. The experiments scheduled to take place on the Mir space station during the Franco-Russian mission (26 July to 9 August) come under this heading.

Lastly, CNES is participating in a whole series of astrophysics programs (such as the Hipparcos star mapping satellite, ISO [Infrared Space Observatory], and the Soho [Solar and Heliospheric Observatory] solar observatory) as well as programs for the exploration of the solar system (Venus, Jupiter, Mars, etc.). In spite of the shadow of budgetary restraint hovering over the European programs, CNES still has ambitious plans. It is already studying the possibility of installing an observatory on the far side of the moon.

#### 1992 CNES Budget by Major Categories (Including Tax)

	Current Francs (Millions)			
	1991	1992	Change	Change
	(Adjusted)		(Millions of francs)	(Percent)
Program authorizations	7,153	7,790	+637	+9%
Regular expenditures	776	809	+33	+4%
Internal resources	2,142	2,131	-11	-1%
Total	10,071	10,730	+659	+7%

**1992 CNES Budget by Major Categories  
(Net of Revenues)**

	Current Francs (Millions)			
	1991 (Adjusted)	1992	Change (Millions of francs)	Change (Percent)
Program Support and Operations	697	753	+56	+8%
Technical resources	397	432	+35	+9%
CNES and ESA operations	300	321	+21	+7%

**1992 CNES Budget by Major Categories  
(Net of Revenues)**

	Current Francs (Millions)			
	1991 (Adjusted)	1992	Change (Millions of francs)	Change (Percent)
Space access	3,825	4,328	+503	+13%
Science	1,111	1,267	+156	+14%
Applications	1,269	1,258	-11	-1%
Planning	381	420	+39	+10%
Program support and operations	697	753	+56	+8%
Value added tax	251	184	-67	-27%
Total, program authorizations	7,153	7,790	+637	+9%

**1992 CNES Budget by Major Categories  
(Net of Revenues)**

	Current Francs (Millions)			
	1991 (Adjusted)	1992	Change (Millions of francs)	Change (Percent)
SPACE ACCESS:	3,825	4,328	+503	+13%
Major La Hague programs:	3,097	3,571	+474	+15%
Ariane 5	1,928	2,290	+362	+19%
Columbus	242	330	+88	+36%
Hermes	905	927	+22	+2%
DRS [data relay satellites]	22	24	+2	+9%
Ariane 4	178	193	+15	+8%

CSG [Guyanese Space Center]	534	525	-9	-2%
Miscellaneous	16	39	+23	+144%
SCIENCE:	1,111	1,267	+156	+14%
Sciences of the universe	934	1,062	+128	+14%
Earth/environment	450	526	+78	17%
APPLICATIONS:	1,269	1,258	-11	-1%
SPOT	729	752	+23	+3%
Artemis	103	50	-53	-51%
Miscellaneous programs (IOC [operational optical laser link], EOOP, Argos, etc.)	540	506	-34	-6%

**France Telecom Establishes Scientific Advisory Council**

92WS0661B Chichester INTERNATIONAL  
TELECOMMUNICATIONS INTELLIGENCE  
in English 15 Jun 92 p 1

[Article: "France Telecom Establishes Scientific Advisory Council"]

[Text] France Telecom has set up a scientific advisory council whose panel is made up of members of leading independent scientific authorities. The French operator lists the council's missions to include "defining the directions of long-term research, benchmarking of current research against the global state-of-the-art, and assessing the potential of the group's research resources and organisation." The council also seeks to strengthen research ties between France Telecom and other European countries.

The 12-member scientific council is chaired by Jacques Friedel, who is president of France's Academia des Sciences.

Ten of the members were selected to ensure a multi-disciplinary make-up which spans key telecommunications-related areas, France Telecom said. The two remaining members are from France Telecom: Michel Feneyrol is head of the CNET telecommunications centre, and Jean-Pierre Poltevin is director of France Telecom's production unit.

France Telecom's research and development expenditures totalled FF4 billion in 1991, or about 4 percent of turnover. Half of last year's sum went to the CNET research centre and the remainder was used to fund work carried out under research contracts by both state laboratories and private-sector businesses.

### **German, Dutch Research Efforts Compared**

92WS0598B Duesseldorf *HANDELSBLATT* in German  
4 Jun 92 p 26

[Article by Tom Horn and Tom Langendorf: "The Scientific Performance is Good, Technology Needs to Play Catch-up"]

[Text]

#### **Research and Development/In the Netherlands and In Germany**

Using some indicators, the scientific and technological state of a country can be determined. To do this, you observe the quantity of money (input) on the one hand and the performance (output) on the other. These indicators show that the Netherlands have achieved a good performance in the scientific area. As concerns technology, however, a warning is appropriate.

The scientific achievements of the Netherlands can be assessed as good. In the technological area, however, Dutch industry loses ground. We drew this conclusion from an international comparison study. For Germany, that is, the former Federal Republic, more or less the opposite applies. Technology is advancing, science retreating.

Drawing a conclusion is one thing, making recommendations to the government based on this conclusion is something else.

#### **Chemicals and Electronics Lead**

For example, one recommendation might be for more intensive support of industrial research and development by the Dutch government. Governmental support for Dutch companies is already larger than in Germany. Despite this, these companies have not invested more in research and development (R&D) than the Germans.

This is the result of the different industrial structures of both countries, among other factors. In the Netherlands and in Germany, a large portion of the R&D investment flows into the chemical and electronics industries. In Germany, however, a lot is invested in the R&D of the machine and transportation industries, two branches of the economy poorly represented in the Netherlands. Other factors, such as the number of technically educated personnel and the enthusiasm for innovation of the management, also play a role. Here, too, the Germans outdo the Dutch.

#### **Publications in Technical Journals**

If we consider the number of scientific researchers with an academic education worldwide—including the former USSR and the developing countries—the Netherlands has only a modest portion of 0.8 percent. Measured on the fraction of the world population constituted by the Netherlands, the R&D efforts are significant: 2.6

times larger. Even in Germany, the researchers are 2.6 times as numerous as the average in the world population.

However, these numbers are unsuitable as a measure. It is better to compare the percentage of R&D expenditures to the gross national product (GNP). In this case, the Federal Republic leads all other industrialized countries at 2.88 percent (1989). At 2.15 percent (in 1988, it was still 2.26 percent), the Netherlands is only average. This position was created by the decrease in expenditures in recent years. This trend shows no signs of reversing.

The results of scientific research are almost always published in the technical journals. To illustrate the performance in this area, two often used indicators exist. These are the number of articles in scientific newspapers, and the number of references (quotations) to publications (books and articles) from a specific country. Both numbers are indexed to the population of the country.

About 2.0 percent (1990) of the articles in international technical journals originated in the Netherlands. In 1984, this was only 1.7 percent. This puts the per-capita fraction of Dutch articles at greater than the large OECD countries, including Germany. There are only four other small countries ahead of the Netherlands. Switzerland is in first place, followed by Sweden, Canada and Denmark. After the Netherlands comes the U.S. and the United Kingdom. Germany comes in eighth. The strength of the Netherlands lies primarily in astronomy, biology, the medical and agricultural sciences.

The fraction of social sciences and the humanities in the publications is low. In the first area, however, the Netherlands is first among non-Anglo-Saxon countries (Germany is fourth). In the second area, the Netherlands comes third after Switzerland and France (Germany is fifth).

The indicator for the number of quotations shows that the Netherlands comes off well in natural sciences. Sweden is a little higher and Switzerland and the United States are much higher. Germany is eighth.

If the total R&D outlays are not considered, but attention is centered only on industrial R&D expenditures, the difference between the Netherlands and Germany becomes even more pronounced. The percentage of R&D outlays measured on the industrial fraction of the gross national product has dropped in the Netherlands from 1.7 percent (1988) to 1.6 percent (1989). Germany's leading position of 2.6 percent is only topped by Sweden.

#### **Numbers From the European Patent Office**

The performance achieved by industrial R&D funds can be measured on the following items: patents, outlays/income for/from licensing and patent fees, export of high-technology products, the increase in worker productivity.

The need to protect a product or a production process by means of a patent is different in various branches of the economy. Even the laws do not agree at all in the different countries. We use information from the European Patent Office (EPO) and the Office of Technology Assessment and Forecast (OTAF), part of the American Patent and Trademark Office as a basis. In so doing, we intentionally restricted our attention to two large industrialized nations (as a reference). These were the United States (OTAF) and Germany (EPO). On its own turf, the Federal Republic does better than the Netherlands (but worse than Switzerland). However, the number of per-capita patents secures fourth place for the Netherlands. On the remote American patent market, the Netherlands are far behind Germany (Switzerland is first, there, too).

Germany and the Netherlands both have a negative technological balance of payments, i.e., both pay out more for licensing and patent fees than they take in. Only the U.S., Sweden and Denmark have a positive balance in this regard.

Concerning the portion of OECD high-technology exports (measured on the fraction of OECD population) the Netherlands and Germany are about equal, even if the Netherlands had a slight advantage in the past (1980). The OECD competitors fell far behind, with the exception of Switzerland.

The Netherlands were well known for their enormous increase in worker productivity. No other OECD country achieved such an increase. In recent years, the Federal Republic, Japan, Switzerland, the U.S., and the leader, France, overtook the Netherlands.

Science is a type of in-depth investment. The return is uncertain. Its most important task is to educate qualified personnel. At the same time, this creates our social and cultural heritage. Science is expensive, but not a luxury. To practice science is a sign both of education and prosperity. This applies to the Netherlands and Germany. Although the Netherlands is more thrifty, their performance is good.

#### Dual System of Technical Education

In contrast to that, technology is primarily a question of survival. Without technology, no country can keep up with international competition. This is the difference between Germany and the Netherlands giving cause for thought.

There is a dual system for technical education in Germany. In the Netherlands, there is an apprenticeship system of mediocre performance. German managers are technicians, Dutch entrepreneurs are mainly business people. German shareholders are satisfied with a lower return if the undistributed profits are reinvested in new technologies. Dutch investors are less patient. The Netherlands apparently give more for social sciences and the humanities, and less for technology. A shortage of engineers is threatening. The Dutch are less informed about technology through newspapers and television than the

Germans or English. The opinion of the Dutch population on technology is less positive than elsewhere. The Dutch are perhaps more interested but they are also more critical, more sober and more reserved. The Netherlands can keep up well in the area of science but drops back technologically.

We are interested in science. However, it appears that we do not start enough with this advantage, that we hesitate when making the move to technology. This is not (only) a question of money for research and education. We must start to enjoy technology and to recognize its necessity, as we do for science. We must recognize, before it becomes too late, that we need technology to survive. That, too, is a question of culture. You build something and pass it on to the next generation. In the Netherlands, it is said that the future belongs to whomever has youth. However, it should also be said that the future belongs—and this future depends greatly on whether we are capable of renewing ourselves technologically—to whomever has something to offer youth.

#### Netherlands: Decreased R&D Spending Said To Endanger Technological Competitiveness

92W.S06610 Zoetermeer SCIENCE POLICY IN THE NETHERLANDS in English May 92 p 24

[Article: "Dutch R&D Spending Ranks Low"]

[Text] Research is no longer growing as fast as it was. The Netherlands is at risk of losing ground to technologically more advanced countries. This is one of the conclusions of the report on technological and scientific indicators (TWIN) published by the Ministries of Education & Science and Economic Affairs. The report also concludes that the relationship between public-sector research, like universities, the Netherlands Organisation for Applied Scientific Research (TNO) and private-sector industrial research has improved in recent years.

Nevertheless, this relationship is still weaker than in other countries such as Germany, France and Britain. The Netherlands still spends a lower proportion of its GNP on R&D than the leaders in the field (2.17 percent compared to 2.79 percent in the U.S., 2.42 percent in France, 2.81 percent in Germany, 2.76 percent in Sweden and 2.84 percent in Switzerland). The sharp rise in total R&D spending between 1984 and 1987—due mainly to increased efforts in industry—has narrowed the gap, but not closed it completely. The rising expenditure on research in this period and the stagnation which followed can both be largely attributed to Philips. The number of smaller companies contributing to the R&D effort has been increasing steadily in recent years. The fact that Dutch industry has failed to catch up with the R&D efforts of its leading competitors can be explained partly by differences in economic structure. The Netherlands has a relatively small industrial sector, which is where most R&D investment takes place. If these differences are taken into account, the gap in spending on industrial R&D between the Netherlands



and the countries at the top of the league works out lower—at around 1 billion guilders. Government support for industrial R&D is modest compared to that in other countries. The Netherlands also lags in the number of patent applications submitted.

The Netherlands' share of publications worldwide, both in the natural and life sciences and the arts and social sciences, has risen. Publications in the natural and life sciences by Dutch authors are cited more than the average.

The Netherlands looks like less fertile ground for science and technology than other countries. Besides lower levels of spending on R&D and the paucity of patent applications, science and technology attract little public interest and receive little coverage in the media. Technology in particular is suffering from too few school teachers with technical skills, looming shortages of technological researchers and too little emphasis on the exact sciences in the universities.

The report pays special attention to the relationship between public- and private-sector research, which seems to have improved in recent years judging by the increase in privately financed contract research, the enthusiasm for projects run by the Engineering Sciences Association (STW) and the use that companies are making of transfer centres. The overall impression, however, is that the scientific climate is not as conducive to technological research as in other countries. First, industrial R&D has stagnated, increasing the gap in total R&D spending between the Netherlands and other countries. Second, a higher proportion of academic research funds is spent on the arts and social sciences, and this figure is still rising. The Netherlands rates below average in the engineering sciences, mathematics and computer science, and the environmental sciences, the very areas which are important for industry.

## CORPORATE ALLIANCES

### Matra Takes Over AEG Mobile Communication

92BR0353 Paris *ELECTRONIQUE INTERNATIONALE* HEBDO in French 16 Apr 92 p 4

[Article: "Matra Finalizes the Purchase of AEG's Mobile Communications Subsidiary"]

[Text] As announced in June 1991, Matra Communication is soon to own 100 percent of both the German company AEG Mobile Communication (AMC) and the Spanish company AEG Radiocomunicaciones (ARC). Pursuant to the terms of the agreement, AEG will acquire 10 percent of the capital of Matra Communication. In 1991 Matra Communication achieved sales figures of almost 6 billion French francs [Fr] in corporate communications networks, mobile communications, fixed and mobile terminals, and public switching in conjunction with MET [Matra Ericsson Telecommunications], a joint subsidiary with Ericsson. By including

AMC's contribution, Matra Communication improves its European position in mobile communications, notably in Germany, where the company's sales figures are expected to reach Fr2 billion in 1992.

### Thomson-CSF Subsidiary, Elettronica Form Computer Joint Venture

92WS0423C Paris *ROBOTS* in French 15 Mar 92 pp 2, 3

[Article: "Syseca Creates Joint Venture in Italy"]

[Text] SYSECA, a systems integration and services company and Thomson-CSF subsidiary attached to its services and data processing branch, has formed a joint venture in Italy with that country's Elettronica, a subsidiary of the IRI (Italian) Institute for the Reconstruction of Industry group. Named EISYS, this new entity is to acquire a juristic existence by 31 March. Its share capital will total 2.6 million French francs [Fr] owned in equal parts by its two shareholders. The new company will specialize in the design, development, and sale of software and computer systems exclusively for the technical and scientific community and mainly for the defense market. In particular, EISYS expects to be awarded a contract in connection with the development of software for the European anti-aircraft and antimissile systems program FSAF [Future Surface-to-Air Family], in which Thomson-CSF, Aerospatiale, and Italy's Alenia are participating. EIS [Ericsson Information Systems] is an (Italian) SSII [data processing services and engineering company] owned 75 percent by Elettronica and 25 percent by its management. It employs 194 persons and, in 1990, grossed a revenue of Fr173 million, 60 percent of which in the defense sector. SYSECA last year posted a revenue of Fr1.3 million with a staff of 2,400 employees.

### France: Matra-Hachette Merger Discussed

92WS0631E Paris *LA LETTRE HEBDOMADAIRE DU GEFAS* in English 14 May 92 p 1

[Text] During a press conference on 5 May, Jean-Luc Lagardere described the reorganization of the Group that he presides, which includes Matra, Hachette, MMB, ARJIL SA and Banque ARJIL. The project involves three major phases: recapitalization of Hachette; the Matra-Hachette merger; simplification of legal and financial structures. The plan was approved by ARJIL SA shareholders, by the financial partners of the Group (BNP, Credit Lyonnais and GAN) and obtained the approval of the traditional partners, the FLOIRAT and Publications FILIPACCHI Groups.

First phase: recapitalization of Hachette; discussions have been held with the major financial partners and the recapitalization plan for Hachette will involve 2800 million French francs [Fr]. The money will be raised by increasing company capital by Fr1500 million (after cashing-in convertible bonds) plus another Fr1300 million, almost all from company treasury. The financial



reorganization will be accompanied by the selling of non-strategic shares representing around Fr1300 million.

Second phase: the Matra-Hachette merger; the project will be submitted to the social authorities of all Group units involved and to the market authorities for agreement and to obtain the necessary authorizations. The new Matra-Hachette Group will remain a corporation with anonymous shareholders and will be quoted on the French stock market. It will favor the expansion of all major professions covered (space, defence, telecommunications, automobile, transportation, audio-visual, books, press, distribution & services) while all divisions retain their identities and independence. It will also make it possible to manage growth more rigorously within a decentralized structure with the advantages that a larger group confers with regard to support and power.

Third phase: simplification of legal and financial structures; the purpose of the reorganization is to simplify control structures and improve transparency. The venture will lead to a regrouping of control holdings (ARJIL SA and MMB) in favor of MMB which will be transformed into a shareholders company and remain quoted on the Paris stock market. This conception will give management the stability and durability needed to improve the development and profit-making ability of the Group. The new Matra-Hachette Group could be a reality before the end of 1992. With its anticipated turnover of Fr53 billion and 50,000 employees, it would be one of France's first private groups of international dimension.

## CORPORATE STRATEGIES

### UK Electronic Components Industry Expects Growth in 1992

92BR0348 Paris *ELECTRONIQUE INTERNATIONALE* HFBD0 in French 2 Apr 92 p 8

[Article signed F.I. "British Components Near T. Recovery"]

[Text] Birmingham—After a catastrophic 1991, the British electronic components industry is expecting a growth of 7 percent for 1992, with recovery by next summer.

The signs are there. Projects are on the upswing. The distribution sector, always the first to pick up, is regaining confidence. The computer and automobile markets are in flux. "We are just coming out of the recession," reckons Brian Atkinson, general secretary and financial and administrative director of ECIF [Electronic Components Industry Federation], whose members are manufacturers and subcontractors based in Great Britain. (There are two different classes of ECIF members: active members who have manufacturing operations in Great Britain, whatever their nationality and associate members, who only have sales or import

activities.). After a truly disastrous 1991, during which the markets for most types of components collapsed after already suffering a drop the year before, ECIF is expecting average growth of 7 percent for its members as a whole and 9 to 10 percent for semiconductor manufacturers. However, this recovery will not bring the industry back to a level comparable with 1990 since, according to Brian Atkinson, the accumulated sales of ECIF members in 1991 were around £2 billion, in other words, £500 million less than in 1990.

### No Immediate Recovery

Manufacturers who were at the last Nepcon Electronics exhibition, which took place on 24-26 March in Birmingham, expressed the same hopes. "In 1991 our sales revenues fell by more than 10 percent after a 3 percent drop in 1990. For this year our aim is to increase sales by 5 percent," said Graham Brock, general manager of Molex Electronics Ltd., the British subsidiary of the American manufacturer of connectors. "The lowest point was reached last summer and, since September-October, we have seen signs of a recovery which allow us to bank on 5 percent growth in 1992," commented Albert Shipton, sales and marketing manager at SGS-Thomson Microelectronics Ltd. One thing is certain: The recovery, in terms of sales revenues, will not happen straightaway. Nobody expects it to happen before next summer. Between now and then, it is likely that a period of doubt will remain. Will the forthcoming elections reassure manufacturers? In general, the manufacturers consider that the election outcome, whatever it may be, will not change much for them. The fact remains that manufacturers are waiting for the elections to determine the rules and atmosphere in which they will be working. In any event, critics of the British government were in fine form at Nepcon Electronics. "If the government had decided to support us the way it helps foreign firms establish themselves in Great Britain, our INMOS factory would not be closing," asserted Raymond Ambrose, market development and research manager at SGS-Thomson Ltd. "We do not understand how the government can fund foreign arrivals when it does not support British firms," was the sentiment at the Oxley stand, a pure-bred British company specializing in optoelectronics. Nonetheless the ECIF representative, Brian Atkinson, declared that he was entirely in favor of Japanese firms establishing themselves on British soil. His explanation was based on the "good citizenship curve." This curve shows the various stages in the settlement process of a foreign manufacturer over a period of time, from the first two years when it only has one commercial outlet (when there is no local manufacturing partnership) to the moment when it sets up a local manufacturing operation based essentially on local components with local specifications and designs. Brian Atkinson assured us that such a level of partnership is soon possible with several Japanese companies. He considers this extremely positive.

### UK: ICL Affected by Computer Industry Recession

92BR0371 Amsterdam *COMPUTABLE in Dutch* 17 Apr 92, p. 7

[Article by Toby Ellson: "Slump in IT Industry Also Hits British ICL. The Netherlands Is Performing 'Shamefully Well'"]

[Text] London—Computer manufacturer ICL did not manage to escape the slump in the automation industry. Its net results dropped sharply from £65 to £39 million (£25 million guilders). In order to reverse this trend, the company—80 percent of which is owned by Fujitsu—is going to cut between 1,000 and 1,500 jobs next year.

According to CEO P. Bonfield, the decrease in profits is due to lower margins on computers. The average profit margin dropped by 5 percent as a result of increasing competition and the customer's lack of interest in new ones. And yet, ICL's chief executive is not dissatisfied with the result achieved. "Considering our competitors' figures, we did not perform too badly," he said at the presentation of the annual results. In addition, a lot of money was invested in the consolidation of Nokia Data and in the introduction of new products.

ICL's revenues increased by 16 percent from £1.61 billion to £1.88 billion (6 billion guilders). This increase includes the last-quarter results of the acquired Finnish company Nokia Data. "The consolidation of Nokia during the last quarter of 1991 added about 12 percent to our revenues," said K. Todd, ICL's financial manager. However, the effect on profits was said to be "insignificant." In October last year, Nokia was taken over for about 640 million guilders. This amount is lower than initial speculations, which assumed a takeover amount of 730 million guilders, but this was prior to ICL's decision not to take over Nokia's defense division. Another 2 percent of the sales increase is attributable to two other takeovers by ICL last year: CFM and Sorbus. Those companies are operating on the European maintenance and facilities management markets.

### Software and Services

The company's Software and Services division grew by 18 percent last year, and accounts for 50 percent of sales revenues. The remaining 50 percent come from hardware sales (from PCs to mainframes). ICL does not rule out eventual losses in hardware sales if profit margins continue to shrink. "so long as losses are compensated by Software and Services. We cannot give up hardware, because we need it, among other things, to win software and services contracts," says an employee from the Dutch subsidiary. ICL achieves most of its turnover abroad: £1.1 billion in Great Britain, Europe contributes another £900 million, while the rest is achieved in the United States.

The Nokia takeover has enabled ICL to turn over £100 million in Germany, which is ICL's most important

growth market in Europe, according to Bonfield. Before the takeover, ICL's sales in Germany amounted only to £10 million to £15 million. In an unusual turn of events, ICL now competes head-on with Siemens when less than a year ago they were negotiating a possible takeover together. Oddly enough, Siemens purchases mainframes and other equipment from Fujitsu, thus, Fujitsu makes a profit off Siemens while its subsidiary, ICL, competes against Siemens in its home market. The first step in this competitive struggle was the Deutsche Bundespost Telekom awarding a £35 million contract to ICL.

Bonfield is convinced that revenues will continue to increase in 1992 due to the full consolidation of the companies taken over. For 1992, he anticipates a £2.5 billion (8.1 billion guilders) sales figure. Eventually, he wants to boost this figure to £4 billion, partly through takeovers. This goal must be achieved by the mid-nineties. By then ICL is expected to go public. To this end, Fujitsu will reduce its interest to 60 percent and Northern Telecom will sell 75 percent of its 20 percent stake.

### 'Outrageous'

Unlike its parent company, the profits (earnings) value of ICL Netherlands is still well above average: 28 million guilders in profits on a sales figure of 180 million guilders, i.e., a ratio of more than 15 percent. By way of comparison, the market average is approximately 7 percent. "Almost outrageous," says an ICL audit member. Nokia Data contributed 28 million guilders to ICL Netherlands' revenues. In 1991, the Dutch subsidiary made a 16 million profit on a total turnover of 132 million guilders. The profits include 6 million guilders for reorganization expenses. This money was spent on optimizing the headquarters in Maarssen and Nokia's office in Woerden. In 1992, another 1.5 million guilders will be allocated for reorganization. For this year, R. de Witte Huberts, manager of ICL Netherlands, expects 28 million guilders in revenues and a 28 million guilders profit.

### Germany's BASF Abandons Composites R&D

92WS04234 Paris *COMPOSITES JET NOUVEAU MATERIAUX in French* 16 Mar 92, p. 1

[Article: "BASF Abandons Composites"]

[Text] The world's number one in chemicals (Germany's BASF) has announced its intention to withdraw from the composites sector, in which it has been prominent since it acquired Celanese in 1985. The reason is that the composites market has not experienced the expected boom. Apart from top-of-the-line applications in automobiles and sports, the domains of utilization and the quantities involved are not sufficient for BASF. And taking into account the bad economic situation in the chemical sector, BASF prefers to focus again on its main products. According to the Solving firm's Jean-François Morin, co-author of a recent study on the sector, "BASF had

nevertheless refined a technique for recycling thermosetting-resin matrices that seemed very promising for the development of composite materials in the automobile sector.

In 1992, BASF will devote some 5 billion German marks [DM] (16.7 billion French francs [Fr]) to foreign investments, 75 percent of which will be made in Europe, with a sizable portion serving to finish building the Antwerp plant, in Holland [as published], which was destroyed by an explosion in 1989. On that site, BASF is building, besides a hydrocracker with production capacities of 480,000 tons of ethyl benzene and 240,000 tons of styrene, 80 percent of the investments outside Europe will be realized by BASF's subsidiary, the BASF Corporation [this passage as published]. Approximately \$500 million (Fr2.65 billion) are to be devoted to industrial investments in the United States.

### France's SNPE Restructures Composites Activities

92WS0423B Paris COMPOSITES ET NOUVEAUX MATERIAUX in French 16 Mar 92 p 2

[Article: "SNPE Eliminates 665 Jobs and Concentrates Its Composites Activities"]

[Text] SNPE [National Powders and Explosives Company] has announced the elimination of 665 jobs out of its existing 6,877, owing mainly to the drop in revenue, which has plummeted from 3.1 billion French francs [Fr] in 1990 to less than Fr3 billion in 1991-1992. This drop could proliferate as a mounting net deficit of some Fr180 million a year over the next three years. The reason given is the cutbacks in military budgets, which account for 60 percent of the company's revenue. This deficit is thus impelling the group to diversify its activities with emphasis on fine chemicals.

Moreover, starting next May, SNPE will concentrate its composites activities around a single pole. The Brunet-Sicap subsidiary will manage and coordinate the group's other PME's [Small and Medium-Sized Industries] concerned, in particular, its Armor Composite, ATMC, and Structil subsidiaries, each maintaining its specificity within three specialized fields: Aeronautical components parts for fitting out transport systems (HSTS [High Speed Transportation System], aircraft, etc...); and industrial equipment. SNPE grosses approximately Fr150 million in annual revenues in the composites sector.

### Thomson-CSF's 1991 Revenues Down For Aeronautics, Missile Groups

92BR0427 Paris ELECTRONIQUE INTERNATIONALE HEBDO in French 30 Apr 92 p 15

[Article by Michel Heurteaux: "Thomson-CSF Stays on Course for Profitability"]

[Text] Despite an increase in net profits, the group led by Alain Gomez recorded a substantive decline in annual sales figures. Nonetheless, Thomson wants to expedite the program of restructuring and acquisitions.

With 1991 net profits up by 8 percent to 2.34 billion French francs [Fr], Thomson-CSF is doing well, although conditions are hardly favorable. This result, which represents 6.7 percent of its sales revenues, puts the Alain Gomez group in second place behind U.S. Westinghouse (8.5 percent). Operating revenues rose to Fr2.092 billion compared with Fr1.99 billion in 1990. At the close of the fiscal year, its consolidated equity capital exceeded Fr1.5 billion. Taking into account the sizeable budget for restructuring costs in 1990, the heavy expenses made no major impact in fiscal 1991. This may allow Thomson-CSF to offset the losses of SGS-Thomson (Fr581 million) and Sextant Avionique (Fr545 million). Even so, Alain Gomez thinks that the solid financial position puts Thomson-CSF in a very favorable position to develop its strategy of acquiring market shares. Its order book, totaling Fr61.6 billion is at the same level as it was last year, and equals 21 months of production.

However, 1991 consolidated annual sales, totaling a little over Fr35 billion, are down 5 percent. This decrease is quite conspicuous in exports, where sales represent 58 percent of the group's overall annual sales figures, as opposed to 61 percent in 1990. Two areas have been particularly affected: the aeronautics division, whose annual revenues fell from Fr8.14 billion in 1990 to Fr7.37 billion in 1991, and the missile systems division, whose revenues reached only Fr6.2 billion, as compared to Fr8.4 billion in 1990. In the opinion of Thomson-CSF's CEO, there is nothing to worry about. He expected a tightening in sales figures in view of the generalized cuts in defense budgets. In static conditions, this slowdown is expected to continue in 1992 at a rate of 3 percent to 5 percent. In the longer term, Alain Gomez will continue to bet on an "upswing" in the defense electronics market. The overall strategic priorities of Thomson-CSF remain the same: continue to be the pacesetter in professional electronics, maintain a high profitability, and diversify its range of activities in Europe and the United States through acquisitions, as it is doing with respect to the U.S. LTV's missile operations.

### SGS-Thomson Vice President on Future Strategy

92BR0444 Paris ELECTRONIQUE INTERNATIONALE HEBDO in French 7 May 92 p 8

[Interview with Piero Martinotti, vice president of SGS-Thomson, by Jean-Pierre Della Mussia: "SGS-Thomson Facing Several Growth Scenarios"]

[Text] Depending on the capital input by its present and/or future shareholders, the French-Italian semiconductor manufacturer SGS-Thomson is planning several growth scenarios that range from maintaining its current

world market share (2.6 percent) to extending it to 3.3 percent. Piero Martinotti, the company's vice president, answered our questions.

**[ELECTRONIQUE INTERNATIONAL HEBDO (EIH):]** It appears clear now that the closer ties between SGS-Thomson and CEA [Atomic Energy Commission] Industrie will not have a sufficient financial impact on the level of SGS-Thomson's recapitalization to wipe out its debts (\$900 million). Can the company survive with this debt?

**[Martinotti:]** Before responding to this question, the problem should be rephrased. In 1987, before the merger of SGS and Thomson Semiconductors, the two companies combined incurred losses of \$200 million on sales of \$900 million. In 1988, after the merger, losses were reduced to \$70 million in spite of the reorganization, and the first operating profit was achieved. In 1989, we made a few million dollars profit after all financial costs and reorganization expenses. Then, in 1990, losses reappeared due to the crisis and the big drop in the dollar: \$97 million. However, this amount includes taxes and \$65 million interests on loans; the operating loss was only \$20 million. In 1991, losses were of the same order of magnitude, but the operating result was slightly in the black. We thus succeeded in stabilizing our operating situation, and this was done during a full market decline and with a still very weak dollar.

Our operating result will definitely be positive in 1992. If we no longer had debt and reorganization problems, we would be able to achieve growth without input from the outside. Thus, all depends on the financial input that our shareholders will agree to.

**[EIH:]** Your shareholders have not provided any input for a year. Have you been able to maintain your world market share?

**[Martinotti:]** No, our share dropped in 1991 from 2.8 percent to 2.6 percent. This is normal; we have eliminated from our catalog certain products that were no longer profitable to manufacture.

**[EIH:]** What are then your growth alternatives now?

**[Martinotti:]** In any case, we believe that our task is to have a large catalog of products, extending from simple to the most sophisticated VLSI [very large-scale integrated] circuits. Our major product range will thus not change. As regards memories, for instance, we will only make non-volatile and static models, and our major lines of developing dedicated products will remain automobiles, telecommunications, consumer television, and computer peripherals. But we can more or less "fine-tune" this catalog and become a selective broad supplier. This means, for instance in RAM [random-access memories], to supply only fast or special SRAMs [static RAMs], in ASICs [application-specific integrated circuits], gates, and analog and digital standard cells, in microcontrollers, dedicated models, etc.

For instance, we have prepared several development plans, the most ambitious assuming an input of \$1 billion from our shareholders and enabling us to achieve a world market share of 3.3 to 3.5 percent in five years. This plan would, in fact, make it possible to considerably reduce debt and make investments. Less ambitious plans with partial recapitalization would enable us to keep our technologies and our product line and to reorganize in a gentle way, but they would not allow us to increase our market share.

If recapitalization is to prove insufficient, we would have to intervene in a more rigorous manner: greater consolidation and sharper focusing, together with a stricter selection in our product range.

**[EIH:]** You do not contemplate then the development of a large line of microprocessors as second source?

**[Martinotti:]** Not in the short term. This would call for investments that we cannot finance at this time.

**[EIH:]** Where will you situate your new VLSI plants in the future? In Europe, North Africa, or the Far East?

**[Martinotti:]** North Africa is suited for an assembly plant, but lacks the infrastructure for a diffusion plant. Thus, it could only be in Europe or the Far East, depending on the local advantages at the time.

Our U.S. plant will, however, be maintained because it feeds an immense market; the same applies to the Singapore plant, which is dedicated to bipolar products that are much in demand locally.

**[EIH:]** Could you subcontract products that are not sufficiently profitable?

**[Martinotti:]** No, because after all you have to ensure quality in all instances, and that has a price. Europe's value is its capability for innovation. This is what has to be taken advantage of.

**[EIH:]** Is it much more expensive to manufacture "mature" products in Europe?

**[Martinotti:]** Of the order of 15 percent minimum and probably even 20 percent; this is why we manufacture in Europe only components with high intellectual value added.

**[EIH:]** If you cannot find financial partners in Europe (or the United States), will you go look for them in the Far East?

**[Martinotti:]** We are not in favor of a financial alliance with Far East companies. But alliances for joint production could seduce us. Such an alliance would be within the framework of the creation of the "after-Grenoble 92" plant that we have mentioned. It could be done in the PRC, Singapore, or elsewhere.

**[EIH:]** Will you continue on your own in flash memories in the future?



[Martinotti]: We are developing them on our own for the time being and our planning calls for the introduction of the 16-Mb memory by the end of 1993. But alliances cannot be excluded.

### Siemens Increases Investments in New German Laender

92MI0532 Bonn DIE WELT in German 26 May 92 p 15

[Text] Siemens is expanding its operations in eastern Germany considerably more than originally intended and will almost achieve its previously announced target of 5 billion German marks [DM] revenue by 30 September of the current 1991-92 financial year, the company stated in the course of a visit by journalists to Leipzig on Monday. The group now expects to book orders totaling around DM5 billion (as against the previous DM3.3 billion) during the current year, and to bill DM3.7 (1.8) billion. Last year's figures bear little comparison, however.

Figures for last year did not include various newly established firms and takeovers, which accounted for around DM2 billion of orders and revenue, including the spurt in export sales to Eastern Europe, it was stated. These companies were, however, included in figures for the first two quarters of the 1991-92 financial year, which show that Siemens booked orders totaling DM2.4 billion and billed DM1.7 billion in the new laender. Nor did last year's figure of DM1.4 billion for the equivalent period include orders booked and sales billed by the new firms. According to a Siemens spokesman, the company's eastern German operations still showed an overall loss, and would continue to do so throughout 1991-92. Figures varied widely from one sector to another, however. The main problems faced by Siemens in the new laender was the rapid collapse of the Eastern European export markets, which added to the structural and legal difficulties.

The group states that its drive to expand business has brought a steep rise in its deliveries from eastern Germany. Figures for 1991-92 should be around DM1.5 billion, compared with around DM900 million for 1990-91. Its figures show that the Siemens workforce in the new laender currently totals around 19,000, distributed among 11 factories and six distribution, engineering, and servicing companies. The main concentration is in Saxony, which has 8,000 Siemens employees. Siemens will have invested an approximate total of DM1 billion in eastern Germany by the end of 1993. The last Siemens companies still operating as limited liability (GmbH) companies will have been totally integrated by the beginning of the next financial year.

### France: Renault Automation Reports Restructuring

92MI0599B Paris ROBOTS in French 22 May 92 p 7

[Unattributed article: "Renault Automation Selling Its Measurement Activity"]

[Text] Renault Automation has just announced sales of 1,681 million French francs [Fr] for 1991, i.e. a 20 percent reduction compared to fiscal 1990. This drop results primarily from the sale of the engineering activity and from creating a CAD/CAM subsidiary. Because the company, which is again concentrating on its basic lines of business (machining, Fr300 million, car bodies, Fr420 million, assembly, Fr230 million, robotics, Fr220 million), is posting a profit of Fr11 million for the third time in its history. The Renault subsidiary, which makes 70 percent of its sales to Renault and PSA, is planning new sales and alliances. Five years after selling its April automation to Metym Geron and two years after selling its industrial activity to the Dynastion group, the group directed by Jacques Malayras is soon going to put its measurement activity, which accounts for Fr60 million, up for sale. While at it, Renault will announce that it is seeking partners for Sedswad, its mechanical CAD/CAM (Fr51 million), which was made a subsidiary last October. And everyone in the auto industry is aware that it is negotiating with robot manufacturers Comau and Kuka to back its robot activity up with a coherent unit. Why? The attempt at union critical mass, in this sector characterized by a distressing price, was because of the cyclical irregularity of the market. The time when all automakers were purchasing short-term rental shops from the ground up seems to be long gone. In 1988, Renault Automation fabricated 420 jobs. In 1990, it produced 180 and only 140 last year. And its new generation of robots partially introduced at Espiridon are priced 50 percent lower than the preceding generation. We should point out that the group has just recorded Fr17 million in its plant at Caen, which specializes in design and fabrication of machining equipment.

### France: Dassault Electronique 1991 Results Presented

92MI06115 Paris L'ESPRESSO 18 MAY 1992 (11P) (11P) (11P) in English 18 May 92 p 7

[Text] The Ordinary General Assembly, met on 5 May 1992. The chairman, Bernard Duguet, pronounced that in the light of the general 1991 slump, results obtained by the Dassault Electronique Group may be considered to be relatively favorable.

- slight drop in turnover (1.38 percent) from Fr4.6 (Fr3.9 billion);
- substantial orders pending (Fr7.7 billion) representing two years' work;
- a return to profitability (Fr64 million).

Analysis shows that the parent firm has slightly regressed while the subsidiary Dassault Automatismes et Télécommunications continues to grow. Group turnover for 1991 was Fr1882 million (Fr2874 million for the parent firm), orders pending amount to Fr7754 million (Fr8800 million for the parent firm). The chairman, Bertrand Duguet, commented on the outlook for 1992 stating that the group should have a turnover of Fr3.8 to Fr3.9 billion (Fr7.8 billion for the parent firm) and better than



Fr6 billion for the subsidiary Dassault Automatismes et Telecommunications). The group expects to book orders worth Fr3300 to Fr3700 billion which by the end of 1992 would mean pending orders worth Fr7150 to Fr7750 billion. The gap between these figures is due to the uncertainty of defense orders for the parent firm. Much discussion is going on regarding a freeze in defense budgets for 1992, and on the five year military plan. The introduction of this plan in Parliament has been postponed. The same uncertainty pertains to the volume of export orders.

### British Telecom Announces Drop in Profits

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in English 8 Jun 92 pp 23-25

[Text] BT recently attributed the pressures of "recession, regulation and competition" to the first drop in its profits since it was privatised eight years ago.

Preliminary results for the year ended March 31, 1992, showed a reduction in pre-tax profit to £3,073 million, down £2 million on last year. Earnings per share dipped 2.2 percent to 33.2 percent compared with 34.0 percent in the previous year. Group turnover for the year ended March 31, 1992, increased by 1.4 percent to £13,337 million.

Turnover in the fourth quarter ended March 31, rose 0.4 percent from £3,401 million in 1991 to £3,413 million in 1992. Operating profit for the quarter fell by 10.6 percent from £899 million to £804 million, while pre-tax profit fell 6.9 percent from £758 million to £704 million. Earnings per share fell 11.8 percent from 8.6 percent to 7.8 percent.

For the year ended March 31, 1992, inland telephone call revenues were virtually unchanged at £5,171 million, from £5,151 million a year earlier. Inland call volume growth was under 1 percent. International call revenues declined by 1.0 percent from £1,812 million to £1,793 million. Growth in international call volumes of 4 percent, mainly due to the buoyancy of transit traffic, was more than offset by the effect of price reductions, including the 9.6 percent overall reduction introduced in September 1991 for outgoing international calls.

Telephone exchange line rental revenues grew by 11.8 percent to £2,317 million due in the main to price increases in this service in September 1990 and 1991 as part of BT's continuing rebalancing policy. The number of exchange line connections was just 0.9 percent higher in March 31, 1992 than a year earlier, with business lines 1.2 percent higher and residential lines 0.8 percent higher.

Revenues from the supply of customer premises equipment declined by 1.3 percent to £1,251 million. Other sales and services revenues increased by 1.9 percent to £3,003 million with rapid growth in call interconnection

with BT's major UK competitor Mercury Communications, and strong growth in visual and broadcast services and marine activities.

Group operating costs increased in the year by 3.1 percent to £9,922 million.

Staff costs increased by 1.5 percent to £4,420 million as a result of fewer people being employed and less overtime worked largely offsetting the effect of pay increases. The number of people employed by the group fell by 16,400, some 7 percent of the workforce, to 210,000, with the fourth quarter showing a decrease of 7,500 people. Redundancy costs charged against profits totalled £30 million.

BT has announced plans to reduce jobs by up to 24,000 during the year ended March 31, 1993. This includes some 20,000 people who are expected to leave under a voluntary release scheme. BT estimates this will cost around £400 million (excluding the incremental liability for pension benefits for early retirement, estimated at around £550 million). Included in the £400 million is an estimated £120 million relating to managers and professional people which will be charged to the restructuring provision already established for that purpose at the announcement of the group reorganisation.

Depreciation rose by 6.3 percent to £2,056 million following the recent investment in transmission equipment and digital telephone exchanges. Payments to telecommunications operators increased by 6.5 percent to £952 million reflecting the growth in international transit traffic and competing UK networks.

Other operating costs increased by 0.7 percent to £3,168 million.

Operating profit fell by £116 million to £3,415 million which BT attributed to the lack of growth in demand and tighter price controls introduced in the year. Strong positive cash flows, however, reduced the net interest charge by £113 million to £304 million with the result that profit before tax at £3,073 million was £2 million lower than in the previous year.

Capital expenditure on plant, equipment and property totalled £2,448 million compared with £2,758 million in the previous year. Expenditure on land and buildings was lower and less was spent on the Cellnet network after the major investment programme in the previous year. Expenditure on local digital exchanges was maintained at around the same level as in the previous year whilst there was continuing high expenditure on fibre optic cable systems.

## Expenditure on Tangible Fixed Assets (£m)

	Year ended March 31		% chg
	1992	1991	91-92
Plant and equipment			
Transmission	1,173	1,310	-10.4
Telephone exchanges	722	799	-9.6
Other network equipment	281	284	-1.0
Computers and office equipment	170	188	+1.2
Other, including decreases in engineering stores	46	84	-45.2
Land and buildings	54	113	-52.2
Total expenditure	2,446	2,758	-11.3

The board is recommending a final dividend of 8.7 percent per share to shareholders giving a total dividend of 14.4 percent per share for the year, an increase of 8.3 percent over the previous year. An interim dividend of 5.7 percent per share was paid in February 1992. The proposed final dividend of 8.7 percent per share, if approved at the annual general meeting, will be paid on September 14 to those shareholders on the register on August 8, 1992.

Preliminary Results for the Year Ended March 31, 1992  
(£m, except earnings and dividends per share)

	1991	1992	% chg
Turnover	13,154	13,337	+1.4
Operating profits	3,331	3,415	-3.3
Finance profits	3,075	3,073	-0.1
Profit after tax	2,080	2,074	-0.3
Earnings per share	34.0%	33.2%	-2.3
Dividends per ordinary share	13.3%	14.4%	+8.3

In the latest quality of service figures for the six months ended March 31, 1992, BT claims that less than one call in 250 fails to get through because of faults or congestion on the network and more than 98 percent of customer faults are cleared in two days. Other figures include:

- More than 92 percent of orders from business customers and more than 96 percent of orders from residential customers, completed by the date agreed.
- 85 percent of residential customers' faults were cleared within nine working hours or with successful appointments.
- For business customers, 87 percent of faults were cleared within five working hours or by successful appointment.

—More than 96 percent of private circuits were installed in standard lead time or by dates arranged with customers.

—93 percent of calls to Directory Assistance Service and 94 percent of calls to Operator Assistance Service answered within 15 seconds.

—More than 95 percent of public payphones working at any one time.

## EUROPE-ASIA RELATIONS

## China, ESA Cooperate on Multipoint-Detection Satellite Project

92P60333X Beijing ZHONGGUO KEJUE BAO  
[CHINESE SCIENCE NEWS] in Chinese 22 May 92  
p. 1

[Article by Xiao Jun (2556 0689): "Curtain Drawn Back on China-ESA Cooperation on a Multipoint-Detection Satellite"]

[Text] A joint China-European Space Agency (ESA) project involving a multipoint-detection satellite was recently unveiled in Beijing.

ESA's Space Sciences Advisory Committee Chairman Prof. Southwood and a delegation of scientists from Britain, France, Germany, Sweden, Austria and other nations arrived in Beijing for joint exchanges and consultation with Chinese scientists.

The group has decided to build a China Multipoint Satellite Scientific Data Center and computer network, as well as to engage in other development projects. The multipoint satellite system, a project of ESA and NASA, is scheduled to be launched about 1995, and includes four satellites forming one four-sided body.

This satellite system will be used to detect fine 3-D particles in the plasmas and electromagnetic fields of the earth's magnetized [atmospheric] layers, and is one of the most important space detection activities slated for

the 1990s. Chinese Academy of Sciences' Space Center research fellow Liu Zhenxing [0491 2182 5281] initiated the contact with ESA officials in November 1990 via a formal indication of China's desire to participate in the project, and the ESA then approved the request.

This marks China's first participation as a formal member from beginning to end in an international cooperative space project.

#### **Philips Sets Up Electronics Plants in PRC**

92BR0421 Paris *ELECTRONIQUE INTERNATIONAL*  
HEBDO in French 30 Apr 92 p 5

[Text] At the same time as it is setting up an integrated-circuit production site in Shanghai in conjunction with the Chinese Government, the Philips concern has announced the signing of a contract for establishing a jointly-owned company in Suzhou, PRC, for producing television tubes. The future company, in which Philips will have a 51 percent stake, could carry the name Philips Consumer Electronics Technology and Development. It will produce tubes with diameters of 14, 21, and 25 inches using technologies to be transferred by the Dutch group.

Construction of the Shanghai-based integrated-circuit production site began in 1989 and was completed at the end of 1991. Once again, it involves a joint company of which Philips owns 51 percent and the Chinese Government, 49 percent through the Shanghai-based factory of Radio 7. In 1992, the factory is to begin production of bipolar and complementary metal-oxide semiconductor (CMOS) integrated circuits on 125-mm diameter wafers (also based on technologies transferred from the Netherlands). The circuits, destined for radio and television systems, will be sold on the Chinese market, as well as in other southeast Asian countries.

#### **Sharp CEO on R&D Investments in Europe**

92BR0424 Paris *ELECTRONIQUE INTERNATIONAL*  
HEBDO in French 30 Apr 92 p 7

[Interview with Sharp Director Shoji Kataoka by Elizabeth Feder: "European Research Interests Us"]

[Text] Up to now, Japanese R&D has been concentrated in Japan but the situation is changing. Sharp has just established a research laboratory in England, close to Oxford. According to Shoji Kataoka, executive director of Sharp's central R&D division, geographic diversification and cooperation with local universities have become the strategy for the future.

#### **[ELECTRONIQUE INTERNATIONAL HEBDO**

**(EIH):** Decentralization of production activities outside of Japan is an everyday occurrence for the Japanese. However, is geographic diversification indispensable with respect to R&D? Why begin with Europe?

**[Kataoka]:** We decided that a genuine R&D activity in Europe was necessary prior to creation of the single

market in 1993. We noticed that Europe has a real tradition, above all in basic research, e.g., in optoelectronics, which is one of the activities of our UK center. In the beginning, our goal was to open research laboratories in the United States and in Europe. Europe became a priority simply due to the critical date, 1993. In addition, we already have three production plants in Europe: one in England for photocopiers, one in Spain for television sets, and one in France, which is initially being used for the manufacture of fax machines, but which was designed for producing all types of computer equipment. In reality, we do not yet have any basic research activity in the United States. It is politically difficult to start up such activity there due to the constant frictions between our two countries. Europeans have a much more intellectual approach.

**(EIH):** For what reason, in particular, did you choose Great Britain for setting up your European laboratory?

**[Kataoka]:** We made a study and visited a number of locations. We had drawn up more than 20 points for making a choice, and Oxford's Science Park received the highest marks. We decided that it would be necessary to settle in a dedicated science park, close to universities, easily accessible from Japan, in a nice environment, and posing few language problems. We visited Stuttgart, Frankfurt, and locations in the Black Forest in Germany; Grenoble, in France; and Edinburgh, in Great Britain. The choice was finally made for England, especially because of the language, and for Oxford because of its proximity to London with its international airport. Cambridge was already too congested from our point of view. We have signed cooperative agreements with five British universities, as well as with European companies.

**(EIH):** What does the Oxford laboratory offer you that you could not find in Japan?

**[Kataoka]:** Sharp Laboratories of Europe was created within the framework of a global strategy. In Japan, it became evident that there was a shortage of basic know-how in certain fields. In those areas, we have to take advantage of the know-how where we find it abroad; it need be. At Oxford, research is focused on optoelectronics and, in computer science, basically on speech processing. Our goal is to develop the most sophisticated automatic translation program. With its linguistic diversity, Europe is the ideal location for such a project. In Japan, we have been working on Japanese-to-English translation programs for some time, but that is now restricted. In Europe, we have decided to work in the three major languages, English, French, and German. A fourth language will probably have to be included.

**(EIH):** What is Oxford's share in the R&D activities within the Sharp Group?

**[Kataoka]:** Within the Sharp Group, R&D is split into two divisions, central R&D on the one hand, and laboratories integrated into product divisions on the other. In Japan, we have diversified our R&D, as well. Sharp is headquartered in Osaka and the Osaka region

but it is important that we have a presence in Tokyo, especially in the field of computer technologies. Thus, a new building is under construction close to Tokyo. The projects that will be carried out there essentially involve medium- and long-term R&D in basic technologies. In Japan, we have seven laboratories dedicated to medium- and long-term research, like the one in Oxford. Oxford represents even less than 10 percent of the group's total central R&D budget. It currently has a staff of about 30 researchers, an all-European team. Two expansion stages are planned: The first, within the next three to four years, will be to about 50 researchers; in the longer term, the team will expand to about 100.

### **European Strategy for Nippon Car Manufacturers Viewed**

92BR0466 Zellik *BELGIAN BUSINESS & INDUSTRIE* in Dutch Jun 92 pp 40, 43, 46

[Article by Wim Heirbaut: "Supplies: Fierce Fight To Quality"]

[Text] Japanese automobile manufacturers are expanding their base in Europe. How do they work with their suppliers? *BELGIAN BUSINESS & INDUSTRY* asked Nedcar, Nissan, and Toyota.

Nissan, Toyota, Honda, and Mitsubishi have developed production lines in Europe. Either they start with a brand-new factory, as Nissan, Toyota, and Honda have done in Great Britain; or else they attach themselves to the existing production lines of western automobile manufacturers. For instance, Mitsubishi is building cars together with Volvo in the Dutch town of Born; and Volkswagen has been producing a Toyota pick-up truck for the last two years in Hannover. Mazda does not appear in the list. This Japanese firm has a cooperation agreement with Ford. Rumors about possible cooperative production lines on the continent of Europe have been doing the rounds for some time.

In order to be able to sell their cars on the European market, the Japanese have to comply with the "Local Content" regulation. This means that cars built in Europe have to contain 80 percent locally bought components. Furthermore, there is a great pressure on the Japanese to use European components in cars produced in Japan. This creates opportunities for European suppliers. We asked Toyota, Nissan, and Nedcar—the joint venture between Volvo and Mitsubishi—about these opportunities.

### **Toyota: 400 European Suppliers**

Toyota is strongly integrated within Europe. It has been producing sedans in Portugal since October 1968, pick-up trucks in Germany since January 1989, and forklift trucks in France since January 1987. Toyota is also building a factory for private cars in Burnaston in Britain (with a capacity of 100,000 cars per year in the first stage) and a motorcycle factory in Shotton. Toyota's

headquarters for Europe is in Brussels, while the technical, design, and training centers together with the CA [conversions and accessories] laboratory are located in Zaventem. A component depot is being built in Diest (to be ready by the end of 1992) and an office block is being built in Zaventem (to be finished by the spring of 1993).

Hajime Yamamoto, representative of the Parts Purchasing Department in Brussels: "Toyota has two divisions in Europe that buy components. I, myself, buy components for factories in Japan, while my colleague Robinson buys them for the factory in England. The design center in Zaventem works for Great Britain as well as for Japan."

According to Yamamoto, there are already 400 European suppliers qualified for the factory in Burnaston. There are also 18 European companies—three of which are Belgian—that supply to factories in Japan. "We are still negotiating with other Belgian suppliers," says Hajime Yamamoto.

What are the purchasing criteria he employs? "The price is the most important criterion, but so are advanced technology, recyclability, and precision. Long transport distances places European suppliers at a disadvantage compared to Japanese competitors, but if there is, for example, a technological advantage, then we will buy in Europe. We need such advanced technology for sports cars."

The most significant difference between European and Japanese suppliers is the form that cooperation takes, says Yamamoto. "Japanese subcontractors are used to having a long-standing relationship with the contracting company, so that both understand each other well."

### **Nissan: High Entry Threshold**

The Nissan factory in Sunderland, Britain, is the textbook example of a very efficient "transplant." At the moment, 120,000 Primera mid-range cars are built there each year. A second model, the successor to the small Micra, will be introduced in October this year and production will be increased to 175,000 cars a year. The aim is to increase production to 270,000 cars a year by 1993. The installed production capacity will then amount to 300,000 cars a year. Nissan is investing £850 million in order to achieve this goal, thus making Sunderland the largest Japanese investment in Europe.

Peter J. Hill is purchasing director for the factory in Sunderland. Previously he was purchasing director for the British company Rover. According to Hill, Nissan is already achieving the 80 percent local content requirement for the Primera model. Nissan orders £400 million worth of goods from 179 European first-line suppliers per year. The majority of these are British—120 companies—but there are three companies based in Belgium that deliver to Nissan: Lemmerz, Monroe, and Valoe Lighting. "For the successor to the Micra we will need another 15 European suppliers. By that time, we will be buying goods worth £700 million per year," says Hill.



Hill deliberately wants to keep the number of first-line suppliers low: "200 is the optimum."

The entry threshold for first-line suppliers is high. "Quality, cost, delivery, development, management—in short, QCDDM—are the five factors we take into account when looking at a supplier," says Peter Hill.

The department run by John Burke, supplier quality assurance manager helps suppliers to meet these criteria. John Burke is also involved in the initial selection and evaluation of suppliers. He is assisted in this by Nissan's Technical Center, which has branches in Cranfield, Sunderland, and in Belgium. Burke claims it is not so important if the suppliers do not comply to the criteria right from the start, as long as the management has the right attitude for improvement. An ISO-9000 certificate is welcome, but does not mean much more than a boarding ticket. The real work must follow: constant improvement of efficiency, cost reduction, cooperative development, etc.

European suppliers have come a long way, but they are not there yet: "At the launch of the Primera we saw a defect rate of 5,000 parts per million [ppm]. Now we have a rate of 800 ppm, and our goal for 1992 is 200 ppm. In comparison, Japan has a rate of 10 to 20 ppm," says Burke.

#### **Lemmerz Wins Supplier Award**

In order to support improvement efforts, Nissan has created the Supplier Award. The Belgian-based company of Lemmerz was one of this year's three winners. Lemmerz began in 1987 by supplying aluminum wheels to Sunderland. In 1992, it will be able to make deliveries to the value of 140 million Belgian francs [Bfr]. Peter Hill: "The award goes to a manufacturer showing world class. Because we want the award to be an exclusive one, we only have three winners every year."

Improvements can also be made on a logistics level at Nissan. The factory at Sunderland keeps two and a half days worth of stock at the moment. By the end of 1992, that has to come down to a day and a half and, according to John Burke, they are even thinking of reducing it to 0.7 day worth of stock. John Hill [as published, either John Burke or Peter Hill]: "Suppliers will deliver more frequently, once a day instead of twice a week. Second, about 30 British suppliers will be delivering "ex-works" [as published] to a contractor from the Midlands. We are not advocates of warehousing, because this only means that you are moving your stock elsewhere."

Because Nissan likes to have a long-term relationship with its suppliers, nearly all the places are filled. However: "With the switch to the new Micra, 12 suppliers dropped out. Two found the Nissan standards too high and the other 10 did not meet our criteria. We recently obtained 65 new suppliers for the Primera model and 15 for the Micra. We are slowly getting a fairly stable supplier base. This means we are reaching the stage when we only need to select and evaluate new suppliers for

specific cases" says Peter Hill. But according to Hill there will be very great opportunities for second- and third-line suppliers.

#### **Nedcar: Improvement Program**

Nedcar was born last year when Mitsubishi Motor Corporation, together with Volvo Car Corporation and the Dutch Government, became a shareholder in the former Volvo Car BV. The present Nedcar has two branches: its headquarters and the factory in Born, which produces 100,000 cars per year. Through a 2 billion guilder investment project, Nedcar expects to double this output by the mid-nineties. The Born plant will then also be producing two different car models: a Mitsubishi and a Volvo. The latter is to take the place of the present Volvo 400 series. The models will be defined so that both can be made using the same production process. This has required a great deal of communication between Dutch and Japanese designers and purchasing managers. "The whole engineering and industrialization process will take only two years. In four to six weeks Mitsubishi's engineering department produces an unbelievable mountain of information," explained E.S. Henrix, a Belgian who is general purchasing manager at Nedcar.

For the new project, a separate supply team has been set up to improve communication with Volvo Sweden-Mitsubishi-Renault (another partner with Volvo). E.S. Henrix says, "For the pressed parts we made a comparison between European and Japanese suppliers, and the Europeans were not competitive. They do an operation in five to six steps, while the Japanese can do it in three. It was decided that we would continue to buy pressed parts in Europe, but would also start an improvement program by bringing European suppliers into contact with the Japanese."

All components are bought by Dutch purchasers, including those components from Japan. E.S. Henrix says, "In order to lower the financing and transportation costs, we try to buy as much as possible in Europe. But with engines, for example, we find ourselves with a cost price difference of 25 to 40 percent."

The names of a number of Japanese suppliers are already known. The engines will come from Japan and perhaps also from Renault, formerly an engine supplier. Nippon Seiki's British division will make the instruments.

Between now and the middle of this decade, Nedcar will be going through a complete improvement program: It wants a drastic cut in the total production hours per car (through greater automation) and suppliers will have to deliver systems as complete as possible so as to cut down an assembly time.

Henrix says, "Logistics will be very important in the new situation. Agreements will have to be made particularly with those suppliers that deliver in sequence. Through contacts with Japanese partners, it seems that the suppliers will have to remain competitive as far as quality, development, logistics, and costs are concerned. Quality



is something that is taken for granted, and you pay for it. The Japanese are particularly keen on costs. Not the part price, but the total cost price. This is an ever recurring factor, even at the start of the project phase. The target cost of a component or system appears in the study document."

In addition, Nedcar will drastically cut back on its suppliers because it will be buying complete systems. Of the present 400 first-line suppliers, only 200 to 250 will remain. Henrix says, "The choice of suppliers for the new project will take place in the autumn. To capture a particular order, one has to be very competitive. We want to keep making the best possible use of the knowledge and experience of the Swedish suppliers."

In addition, we want to compare the Japanese with the European suppliers. Finally we have the supplier organization of the former Volvo Car, which overlaps considerably with Sweden. It is a fierce fight to be among Nedcar's first-line suppliers."

#### **Samsung's Kim on Investments in West Europe**

92WS0589A Duesseldorf *HANDELSBLATT* in German  
18 May 92 p 26

[Text]

#### **Samsung Electronics Company: Jump in Consumer Electronics Sales: Management Expects No Improvement in Overall Result**

#### **Interest in Semiconductor Production in Germany Still Exists**

This coming year in Europe, South Korea's leading electronics firm, Samsung Electronics Co., Seoul, wants to open a production center for refrigerators and compressors in the CSFR along with its plants in Portugal, Spain, Great Britain, and Hungary. Hun Kim, Senior Managing Director with responsibility for company planning, explained further in an interview with the *Handelsblatt* that there is continued interest in the construction of a semiconductor production facility in Germany.

In the 1991 business year, Samsung Electronics Co. posted a hefty 16 percent increase in sales volume to 5,227.1 billion won (almost 11 billion German marks [DM]): In the consumer electronics division (58 percent of total sales), sales rose by 15 percent (domestic: up 20 percent, export: up 9 percent), and the semiconductor division (21 percent of total sales) showed an above average increase in sales of 21 percent (domestic: up 71 percent, export: up 24 percent). With a worldwide production volume of \$1.6 billion, the firm ranked thirteenth internationally among semiconductor manufacturers in 1991.

In contrast, a disproportionately low 12 percent increase in sales was reported by both the communications engineering division (16 percent of total sales, domestic sales: up 16 percent, export: up 9 percent) and the

computer division (5 percent of total sales, domestic sales: up 2 percent, export: up 28 percent).

#### **Rising Labor Costs Make Profits Drop**

At the same time, however, reported earnings after taxes dropped by six percent in the past year to 68.6 billion won (about DM140 million). Kim blames this unfavorable development on the "sharp reduction in international competitiveness" of the South Korean firm. This can be attributed to the doubling of labor costs in the past three years, the present high domestic interest rate of 17 percent, and the intensification of international competition which has led to a price drop and thus substantially diminished profitability.

Kim expects a similar trend this year and thus no improvement in the overall result; this despite the fact that an increase of barely 5 percent was agreed upon in this spring's wage negotiations. On the one hand, Kim bases this pessimistic assessment on the fact that the government rejects the demands of export trade for more favorable financing conditions since, because of international trade relations, specific branches cannot be granted special conditions.

In addition, the opening up of the market for competitors' products, for instance from Japanese producers, is a source of concern. Finally, decreased consumer spending in the important U.S. market must still be taken into consideration.

Another severe drain on profits for Samsung Electronics arises from the five-year cross-licensing agreement with the leading Japanese computer manufacturer Fujitsu Ltd. recently announced by the Japanese press. The agreement allows both partners the reciprocal use of patents in the U.S., Japan and Europe. For Samsung Electronics, however, it is tied to payment of nearly DM50 million.

Kim refuses to comment, in accordance with the agreement of the two firms, but indirectly confirms the existence of such an deal. According to Japanese press reports, other Japanese electronics firms are also involved in concluding similar arrangements with their Korean competitors at present.

#### **Kim Expects British Plant To Be in the Black**

Except for the plant constructed in 1982 in Estoril, Portugal (annual capacity: 300,000 color televisions), explains Kim, they are still in a "learning process" in Western Europe. In view of the EC's anti-dumping initiatives, the production centers in Cleveland, Great Britain, (founded: 1987, 240,000 videorecorders and 240,000 microwave ovens as well as 60,000 fax machines) and in Barcelona, Spain, (1990, 120,000 videorecorders) were set up before all the necessary preparations had been completed because restrictions on market access were feared.

In view of the limited capacities, no one is yet enjoying the advantages of declining marginal unit costs through

mass production, in contrast to the Japanese competition. Furthermore, buying components at competitive prices causes considerable difficulties. Kim hopes, however, that the Spanish and British plants will be in the black beginning this year.

On the other hand, the production centers in Budapest, [Hungary], (1990, 100,000 color televisions) and Izmir, Turkey, (1989, 200,000 color televisions) are "in relatively good shape." In Hungary there are plans to list the company there on the stock exchange, which—if market development allows—might even be realized this year. This would then be the first admission of a hitherto wholly foreign-owned firm to the stock market in Hungary.

#### **Refrigerators Will Be Produced in the CSFR Beginning in 1993**

Finally, in order to further strengthen their presence in Europe, the production of refrigerators and compressors is planned in the CSFR beginning next year; the agreement for this project has already been signed. Construction work for this project is due to begin shortly. Production of 200,000 machines per year is planned for the present, part of which are to be exported to the EC countries.

Kim remains interested in a factory for memory chips in Europe, where Samsung Electronics ranks third as a supplier after Siemens and Toshiba. However, because of the high level of funding required, this plan cannot be realized without government money. Earlier, the Treuhandanstalt made Samsung Electronics an "attractive offer" for an investment project in eastern Germany. However, competitors acted more quickly, conceded Kim, so that this opportunity was missed.

Cooperation with a European partner is also possible for the chip plant, regarding which final decision has not yet been made within the company. Appropriate offers are welcome, emphasizes Kim. Germany is one of the possible sites. Since this involves a very capital-intensive investment project, the high German labor costs do not present an obstacle.

Kim is rather restrained in his comments on the commercial expansion of Samsung Electronics in Germany. The competition is "too tough" and the German consumers, in contrast to those in the U.S. and in Great Britain, are less price-oriented. Market penetration is therefore difficult; the level of quality is not accepted to the extent desired, explains Kim.

#### **Large Market for Flat Liquid Crystal Displays**

In the future, Kim wants above all to decrease the dependence on bulk business with memory chips and strengthen the position for application-specific chip types. In addition, a decision on beginning mass production of the 16-megabit memory chip (DRAM) [dynamic random access memory] is on the agenda for the near

future. Samples of this chip type have already been sent to principal customers and evaluated favorably.

A decision must soon be made about this billion-dollar investment project as well as its financing, explains Kim. However, the decision will not be easy because it has become apparent that the chip business is no cash cow; amortization of the invested capital cannot be expected in the short term.

Nevertheless, Kim emphasizes that a solo effort is still being considered for this chip generation. However, because of the high level of investment necessary, he does not want to exclude international cooperation for future memory chip generations.

Finally, Samsung Electronics has a leading position technologically in the area of extremely flat liquid crystal displays in South Korea. A 10.4 inch display (TFT-LCD) was recently developed. By the end of the year, samples of this display type should be available for commercial delivery. No decision has yet been made regarding the construction of a plant for this component. However, because of its many expected uses, the same importance is ascribed in the firm to the area of liquid crystal displays as to the semiconductor area.

#### **Germany's Bosch Builds Technical Center Near Tokyo**

92WS0593B Duesseldorf *HANDELSBLATT* in German  
2 Jun 92 p 22

[Unattributed article: "Technical Center Opened Near Tokyo: Robert Bosch GmbH/Stuttgart Company Seeks Greater Proximity to Japan's Auto Industry"]

[Text] Tokyo, 1 Jun (*HANDELSBLATT*)—On Monday, the Bosch Group opened a Technical Center for applications, sales, and customer service in the field of auto equipment in Yokohama, south of Tokyo. With 250 employees (projected for the end of this year) this center will be the largest such facility of the company in the Asian Pacific region.

Marcus Bierich, CEO of Robert Bosch GmbH in Stuttgart, explained in Tokyo that the center built with an investment outlay of 80 million German marks [DM] is to form the technical interface between the German development departments of the company and Japan's auto industry as well as auto importers in Japan.

Last year, Bosch achieved sales of DM425 million in Japan. Approximately DM180 million was in commercial trade with household appliances, auto accessories, and electric tools. In this area it has been possible to triple sales in the last five years. In addition, there are several cooperative programs with Japanese auto suppliers in the area of electronic equipment for motor

vehicles. According to Bierich, almost 3,500 employees were working in these joint ventures during the 1990-91 fiscal year, taking in sales of which convert to approximately DM1.5 billion.

Hansjoerg Manger, board member of Robert Bosch GmbH, explained with regard to the future tasks of the Technical Center that there is no plan to expand the direct first equipment business in Japan. The plan is to continue cooperation with licensed Japanese partners, but not to engage in its own production activities. Current partners are Nissan Motor Co., Zexel Corp., Nippon Air Brake Co., Mitsubishi Electric Corp., Mikuni Corp., and Shibuya Kogyo Ltd. There are also joint ventures with Japanese partners in the U.S. and in South Korea.

It is a different story with the supplying of production support points for the Japanese auto industry outside Japan. The local presence with the Technical Center will significantly shorten application times and is a significant prerequisite to increasing worldwide involvement with the Japanese auto industry. In addition to supplying Japanese production support points in the U.S., Mexico, South Africa, and Australia, Bosch has also recently succeeded in beginning to do business with Japanese automakers in Europe.

#### **Finland: Nokia, Chinese To Jointly Produce Optical Terminal Equipment**

92WS0621L Chichester *INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE* in English 4 May 92 p 13

[Article: "Nokia Announces Transmission Joint Venture"]

[Text] Nokia Telecommunications has signed a joint venture agreement with the Gullin Institute of Optical Communications to produce optical terminal equipment. The total investment is more than US\$5 million and is Nokia's first joint venture in China. The company began business relations in China in 1983.

Production is to begin this year and will include the manufacture of Nokia's DYNADCARD, MUXCARD and LINECARD transmission products. The facilities will be based in Guangxi province.

In January 1992, Nokia announced a FM135 million contract for the supply of transmission equipment and optical cable to China (see ITI issue 325). Nokia Telecommunications has previously supplied both fixed and mobile networks to the Daqing Oilfield as well as digital exchanges, digital transmission systems and radio links to the Chinese Ministry of Railways and the Shengli and Liao He Oilfields.

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